Veterinary Medicine

VOL. XXII DECEMBER, 1927 No. 12

Published Monthly by the Veterinary Magazine Corporation
4753 South Parkway, Chicago, Ill., U. S. A.
$4.00 a Year
Entered as second-class matter, July 19, 1910, at Chicago, Ill., under Act of Congress of March 3, 1879.
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Veterinary Medicine in 1927

By D. M. CAMPBELL

IF ONE were to attempt to write a history of the veterinary industry of this country for 1927, to give an account of what the veterinary profession has attempted, and what it has achieved in the capacity of private individuals and public officials, in general practice, in research and in official sanitary measures, one would have undertaken a very large task indeed. Fortunately, there is no occasion to undertake so onerous a work here. The readers of VETERINARY MEDICINE have been apprised of these matters as the months of 1927 slipped by, and but a sketchy resumé is sufficient for their reminder.

There have been more eventful years in our history than 1927 has been, though perhaps none more important. 1927 has witnessed the adoption of no outstanding new methods for the treatment or prevention of disease, such as the inflation of the udder in milk fever or the serum simultaneous vaccination of hogs. It has seen no outstanding events in disease control such as the eradication of foot and mouth disease or the launching of the tuberculosis eradication project or the tick eradication project. It has seen neither the beginning nor the culmination of profound changes affecting the personnel of the profession, such as the advent of the motor-car, or the enormous extension of the veterinary service of the army at the beginning of the World War or the establishment of the early veterinary colleges or the creation of the Federal Bureau of animal industry.

It has been just an average year with the veterinary profession and that is to say progress has been made. By general agreement, it is conceded that the acute depression in agriculture following the post-war deflation swept all prosperity from the ranks of the veterinary profession. For the past five years there have been evidences of steady though unevenly distributed improvement in this respect. On the whole, practice was more remunerative this year than last. In places, as in Missouri, Kansas and Oklahoma, practice was a great deal better than heretofore; in other districts as in Iowa and Nebraska, it held the very marked gain made in 1926. In the very considerably flooded areas it, of course, went backward. Small Animal practice everywhere continued the steady gain of recent years probably in most cases with an added acceleration.

Inadequate Salaries

In the hardship that has been inflicted on salaried veterinarians because of inadequate pay, 1927 brought no worthwhile amelioration. Taking the group of veterinarians employed in the Bureau of Animal Industry, the largest group of salaried veterinarians, as representative we find, computed on the basis of the average salary paid each year since 1914, and the purchasing power of the dollar during that period, that on the

average, each veterinarian in the Bureau is now the loser by reason of the failure of salary increase to keep pace with the increased cost of living in the amount of more than $10,000. No wonder individual savings have been swept away and a relative prosperity content and optimism have been displaced in many instances by penury, discontent and despair. The inadequate remuneration of practically all salaried veterinarians, except those in the army and the more fortunate in private employ, is one of the most serious problems of the profession and it affects all. The following table, which is at least approximately accurate, is illuminative in this matter.

Table showing Bureau Veterinarian's average salary, increased cost of living, salary needed to keep pace with that increased cost of living and how much the actual salary lacked of keeping pace with that increased cost of living:

Year	Average Salary Rank and File	Increased Cost of Living	Salary Required to Keep Pace with Increased Cost of Living	Shortage in Salary to Meet this Increased Living Cost
1914	$1,800.00	$ 54.00	$1,854.00	$ 54.00
1915	1,800.00	91.80	1,891.80	91.80
1916	1,800.00	149.50	1,949.50	149.50
1917	1,800.00	763.20	2,563.20	763.20
1918	1,905.00	1,339.20	3,139.20	1,234.20
1919	2,010.00	1,589.40	3,389.40	1,379.40
1920	2,095.00	1,952.10	3,752.10	1,657.10
1921	2,340.00	1,392.30	3,192.30	852.30
1922	2,340.00	1,211.40	3,011.40	671.40
1923	2,340.00	1,276.20	3,076.20	736.20
1924	2,370.00	1,270.80	3,070.80	700.80
1925	2,400.00	1,362.60	3,162.60	762.60
1926	2,420.00	1,346.40	3,146.40	726.40

Total shortage for 13 years	$9,778.90
Estimated shortage for 1927	726.40
Total shortage for 14 years	$10,505.30
Average yearly shortage	750.37

Evidences of Progress

This year has seen splendid progress in tuberculosis eradication among cattle, swine and chickens, but that was forecasted by the progress of recent years. It has seen a wide extension of measures for the control of white diarrhea in chickens which was expected. It has seen a marked improvement in the handling of post-vaccination ailments in swine and in the handling of necrotic enteritis independent of vaccination, but that was a certain sequel of the widespread outbreak of hog cholera in 1926, as was also the large increase in vaccination during the early summer. That is, it was certain, when one takes into account the vigor with which the veterinarians in the swine producing belt attack their problems.

Nineteen twenty-seven has seen the ripple caused by the importation of the hypoglycemia theory and the glucose treatment for parturient paresis start and subside, leaving us no better informed or more capable of handling this disease than we were before. It has seen what at present appears to be a distinct progress made in handling contagious abortion under what perhaps may well be termed, because of its adoption rather than its origination, the Pennsylvania plan. During the year there has come about a better understanding of sweet clover poisoning, more information concerning plant poisoning and snakebite poisoning, and some progress in the handling of parasitisms and Johne's disease. The shortage of students in our veterinary colleges has not been remedied or improved.

Among the new things that have come up during the year that are or may be of importance, as well as may be seen at the time these lines are written, ten weeks before the close of the year, need be mentioned only: Rosenow's contribution to the subject of periodic ophthalmia of horses; Kelser's improvement of rinderpest vaccine; mycotic vaginitis of swine and the recrudescence of what, somewhat paradoxically, is being called "anaplasmosis" of cattle in Oklahoma and adjacent territory. Two new drugs, introcid and rivanola, were introduced during the year, and some new information contributed on the incubation period of distemper in dogs and on the symptoms of strongylosis in horses.

The use of ovarian and testicular grafts in domestic animals has received considerable investigation during the year by European research workers. Apparently some progress has been made in treating both sterility and debility by this method.

An Outstanding Development

The occurrence during the year that holds perhaps the possibility of the most far-reaching effect on the profession is the greatly increased interest, and in very many cases the new interest, that veterinarians have taken in poultry diseases. The poultry industry has developed so extraordinarily during the past five years that disease problems that five years ago were matters of only casual, local or minor concern have assumed an importance that constitutes a menace to this industry that now supplies products of an annual value in excess of a billion dollars—16 per cent of the total value of live stock industry. An industry that produces eggs at the rate of 760 per second, two billion dozen annually, and whose production and sale of baby chicks exceeded 800,000,000 last year. There is a field for poultry practice now, by no means fully occupied, and there are prospects that it will be largely extended in the field of both the practitioner and the official live stock sanitarian.

The veterinary magazines, new veterinary books and the state experiment station and Federal department of agriculture bulletins have contained much during the year with which the well-informed veterinarian must needs be familiar. No complete review of this can be given in the space available, but among the more important discussions the following articles should be reread before the veterinary literature of 1927 is laid aside for that of 1928.

B. Abortus Infection in Man

C. M. Carpenter[1] reported a study of ten strains of *Brucella abortus* of the bovine type isolated from ten cases of undulant fever in man. The organisms gave typical, cultural serologic and inoculation reactions for the bovine and porcine strains of *B. abortus*. Five pregnant heifers were injected with five of the strains and all aborted within twenty days. The *B. abortus* was isolated from the fetus, the milk and the uterine discharges in every case. The strains were very virulent as shown by the early abortions produced, the serious systemic effect in the heifers, the persistence of the organism in the udder and the marked lesions resulting from guinea-pig inoculation.

All ten of the victims of undulant fever had consumed milk from herds where abortion of a very virulent type was rife. No other source of infection of the victims could be discovered.

"Bovine Infectious Abortion a Public Health Menace,"[2] is the subject of a discussion in VETERINARY MEDICINE, in which the approximate identity of the organisms causing abortion in cattle and malta fever in goats is pointed out. The latter organism is highly pathogenic for man. The increasing prevalence of undulant fever in man, the result of infection with the organism of bovine origin, is commented upon, and the suggestion made that infectious abortion in the cow constitutes a public health problem, that presents the possibility of flaring into importance transcending that of bovine tuberculosis. Veterinarians are urged to inform themselves on the subject that they may be able to handle the disease in cattle from a public health angle if the occasion should suddenly arise.

Diagnosis of Infectious Abortion

C. P. Fitch[3] reported an effort begun in 1924 to bring about uniform methods for conducting serological tests for bovine infectious abortion, and gave the results obtained from sending samples of serum to various laboratories and asking for a diagnosis on the basis of the test used in those laboratories, in some cases the agglutination alone and in others the complement fixation alone and in others, both tests. The results were astonishingly varied, and as a result a number of laboratory directors met in Chicago in 1925 and adopted a uniform system for carrying out these tests. Some mod-

[1] Results of Injecting Pregnant Heifers with Brucella Abortus Isolated from Man, by C. M. Carpenter, New York State Veterinary College, at Cornell University. Journal of the American Veterinary Medical Association, Vol. 23, No. 4, January, 1927.

[2] Bovine Infectious Abortion a Public Health Menace. An Editorial. Veterinary Medicine, Vol. 22, No. 2, February, 1927.

[3] The Value and Need of Uniform Methods for Conducting Tests for Bovine Infectious Abortion, with an Account of Experimental Work, by C. P. Fitch, Chief, Division of Veterinary Medicine, University of Minnesota. Proceedings of the 30th Annual Meeting of the United States Live Stock Sanitary Association.

ification in the plan was made as a result of experience, with the outcome that diagnoses made in these laboratories on samples of the same serum in 1926 were remarkably uniform. The discussion constitutes a strong plea for the adoption of uniform methods in the matter of applying the agglutination and complement fixation tests for this disease by all diagnostic laboratories as a preliminary to any concerted effort in the control or eradication of infectious abortion in cattle.

State-wide Control of Infectious Abortion

The Pennsylvania plan for the control and eradication of bovine infectious abortion was discussed by T. E. Munce.[4] Dr. Munce pointed out that infectious abortion strikes to the heart of the cattle breeding industry and dairy business, destroying the very nucleus—the calves—and thus defeating the purpose of the breeder.

He stated that infectious abortion can be diagnosed clinically with a fair degree of accuracy, but that much time is lost in awaiting for clinical manifestations of the disease, and that for practical control, one must rely upon serological tests for the discovery of the disease.

He states that in one prominent cow testing association in his state—Pennsylvania—it was discovered that 65 per cent of all the cows sent to the butcher was on account of their failure to reproduce, the result of, or a sequel to, infectious abortion.

The Pennsylvania bureau of animal industry has been experimenting in the control of infectious abortion in cattle for thirty years, and regards the most successful method for the prevention and eradication of the disease to be one based on sanitation, with a blood test used to determine the presence of infection in the individual member of the herd. The Pennsylvania plan for the control of infectious abortion, which is now official in that state, is a very close adaptation of the plan for the control and eradication of tuberculosis, with the difference that the work is carried out by the local practicing veterinarian under the supervision of the state; there is no indemnity paid for reacting animals; reacting animals are not necessarily slaughtered but are disposed of in a manner approved of by the state officials, and serological tests instead of the tuberculin test is used for the discovery of the diseased animals.

The present plan was officially inaugurated six years ago, and at the close of 1926 there were 25 approved abortion free herds and 500 herds under supervision and in the process of being approved as abortion free.

The work is at present limited to herds that are tuberculosis free or in the process of becoming accredited under official supervision. The adoption of the plan is entirely voluntary on the part of the breeder. Both the breeders and the live stock sanitary authorities in Pennsylvania are well satisfied with the working of the plan and gratified with the results obtained, and look forward to its rapid extension in that state.

The author stated that infectious abortion has apparently increased in prevalence in the United States during recent years and attributed this in part to the use of living culture vaccines and in part to the effects of extensive tuberculosis eradication which has necessitated restocking thousands of herds of dairy cattle, and in this restocking the owners too frequently ignored the possibility of introducing diseases other than tuberculosis, with the result that they brought into their herds a new disease perhaps destined to be even more costly to them than the disease eradicated.

He expressed the greatest confidence in the ability of the veterinary profession to solve and to handle satisfactorily infectious abortion and made an earnest plea for many veterinarians who have been indifferent heretofore, to become interested and inform themselves on the matter, and to advise their cattle-owning clients of the measures for handling this disease which may possibly become economically more important than tuberculosis.

In a discussion of infectious abortion at the veterinary conference of the University

[4] Bang Bacillus Disease (Bovine Infection Abortion), Prevention, Control and Eradication in Pennsylvania, by T. E. Munce, Director Pennsylvania Bureau of Animal Industry. Journal of the American Veterinary Medical Association, Vol. 24, No. 3, June, 1927.

of Pennsylvania, in January, M. F. Barnes[5] covered pretty much the same ground in much the same way it was discussed in the foregoing. He repeats the definition of abortion disease accepted by the United States Live Stock Sanitary Association some years ago and since successfully challenged by Prof. W. L. Williams.

According to Barnes, bovine infectious abortion is a specific, acute, chronic and transmissible disease which affects cattle of all ages, classes and breeds, both male and female, and cannot be caused in the absence of Bang bacillus, its specific cause. Apparently, among others well informed on this subject, this restricted definition has been abandoned and the Bang bacillus, *Brucella abortus*, is looked upon as one of several organisms that may and do cause infectious abortion in cattle, some stating that the bacillus is present alone or in combination with streptococci and other organisms in not more than 60 per cent of the abortions due to infection.

Doctor Barnes holds that no other disease of live stock now prevalent in this country is deserving of as much thought from the standpoint of herd efficiency and that no other prevalent disease handicaps so much the improvement of pure breeds of cattle. His discussion of the Pennsylvania plan is, of course, similar to that already given above.

Control of Infectious Abortion in Herds

A. T. Kinsley,[6] in a resumé of a recent publication by Fitch, Boyd and Lubbehusen, describes the method of handling contagious abortion in an infected herd on a plan similar to the Bang method for handling tuberculosis. That is, a separation of the diseased from the healthy animals and their maintenance as distinct herds on the same farm.

While it is conceded that the Bang method as applied to tuberculosis eradication has found no favor with the American cattle breeders, the principal objection to this method when it comes to handling contagious abortion does not obtain, i.e., the lack of market for the product. Nor is the danger to calves anywhere near so great in the case of abortion disease as it is in tuberculosis.

It is pointed out clearly that some infected cows, as shown by the serological test later show a negative reaction, and that many such positive reactors never have nor ever will abort. This accepted fact needs very serious consideration in the adoption of any method relying upon slaughter for the disposal of reactors.

C. H. Case,[7] in discussing non-breeders in dairy herds at an Iowa veterinary meeting, pointed out a matter that has been frequently overlooked in the past but is receiving a good deal more attention at the present time, the fact that the bull is often responsible for sterility in the herd. In a number of instances in his own practice where infectious abortion was undoubtedly present and failure to reproduce occurred in a high percentage of the cows, the difficulty was entirely overcome by the substitution of a good bull for the defective one in use. Doctor Case regards many strains of infectious abortion as being of comparatively low virulence and capable of being overcome by the building up of the resistance of the cows by good care and feed, and by using a vigorous, healthy bull.

R. R. Birch,[8] at the veterinary conference at the New York State Veterinary College, presented a discussion of methods for handling Bang abortion disease in a manner too extensive for reproduction here. Some of his conclusions, matters that have been overlooked or not recognized heretofore, may be stated.

When the serological test is made soon after the *B. abortus* is introduced into a herd, the agglutination records will correspond closely to the clinical history of the animals. When it is made long after the infection is introduced there will be many

[5] Bang Bacillus Disease (Bovine Infectious Abortion) Prevention and Control, by M. F. Barnes and A. L. Brueckner, Pennsylvania Bureau of Animal Industry. Veterinary Medicine, Vol. 22, No. 4, April, 1927.

[6] Abortion Disease Control in Cattle, by A. T. Kinsley. Veterinary Medicine, Vol. 22, No. 5, May, 1927.

[7] Notes on Dairy Practice, by C. H. Case. Veterinary Medicine, Vol. 22, No. 3, March, 1927.

[8] Some Suggestions Regarding the Handling of Bang Abortion Disease, by R. R. Birch, New York State Veterinary College at Cornell University. The Cornell Veterinarian, Vol. 17, No. 2, April, 1927.

reactors that are satisfactory breeders. A herd consisting of long-time reactors and immune non-reactors often shows a fair breeding efficiency. If the herd contains many reactors and the owner is not so situated that he has reasonable assurance that he will be able to segregate or dispose of them, his long-time reactors will be his best property.

It is assumed too often by the breeder that when he has purchased non-reacting individuals with satisfactory breeding history, that he has done all that he can to protect himself against loss. This is true only if his herd is free from abortion disease. If abortion disease is present in the herd, he will do much better to purchase long-time reactors; and the principle applies regardless of state lines.

Unless the herds in a state are relatively free from abortion disease, there is no logical reason to prevent the entrance of cattle which react to the agglutination test. Where abortion disease exists in the herd, a pregnant reactor, because of the resistance she has developed, is worth more to that particular man than a non-reactor. It is a mistake to set up official barriers which prevent transfers that are mutually advantageous to seller and buyer and harmful to no one.

When the mere act of aborting is the basis of culling, the farmer almost never succeeds in freeing his herd of infection. The number of cattle kept together is a very important consideration in the matter of control of abortion disease.

The dangers which attend increase in size in the unit have not been fully appreciated. Subject to certain modifications, the danger in an infected herd may be said to increase by the square of the number by which the herd is multiplied. Thus, in a herd of 10 having a danger factor of 5, multiplying the herd by eight—increasing it to 80—will increase the danger factor 64 times, or to 320. Abortion disease left to itself can scarcely maintain itself in a small unit. In a large unit all the artificial barriers we can erect against it may prove unsuccessful.

Herd management must provide that reactors and non-reactors are not kept together. If this is impracticable on a given farm, the alternative is the maintenance of abortion disease indefinitely.

Endometritis Treatment

J. F. DeVine,[9] in a discussion of chronic endometritis, which he regards as in the main a sequel to abortion disease, indirectly refers to the variance in virulency in different outbreaks of infectious abortion, mentioning as many others have observed, that in herds where a large percentage of the cows have aborted irrespective of age, physical condition or period of pregnancy, that the changes in the generative organs occupy a wider range and are more severe in character than where the percentage of aborters is lower.

Doctor DeVine stresses the importance of training the sense of touch to aid in the diagnosis of chronic endometritis so that changes in the tubes and in the uterus are readily apparent upon examination per rectum. He does not consider simple chronic endometritis as nearly so common a cause of sterility as some other pathological conditions and believes that when uncomplicated and not too severe that it ordinarily yields readily to treatment.

He regards crushing ovarian cysts and the removal of false corpora lutei, massaging the ovaries and uterus as being of the greatest value in the treatment. Further, he uses bacterins extensively and regards them as indispensable in treating herds at a distance where but few and infrequent calls can be made.

Douching the uterus with normal saline or other non-irritating solutions, he regards as of some value in the treatment for the mechanical cleansing, but nowhere near in a class with the other means mentioned in the results attained.

Measures Necessary in Retained Placenta

In the discussion of retained placenta, likewise usually a sequel of uterine infection, DeVine[10] deprecated the value of manipulation, stating that capillaries in the cotyledons cannot be torn with impunity,

[9] Chronic Endometritis, by J. F. DeVine. Veterinary Medicine, Vol. 22, No. 1, January, 1927.

[10] Retained Placenta, by J. F. DeVine. Veterinary Medicine, Vol. 22, No. 7, July, 1927.

reaching the conclusion that we should "never use force to remove a placenta." Where adhesions are extensive, he states that two things are essential: 1. Remove as much of the inflammatory debris and loose membranes as possible without injuring the uterus; 2. Encourage involution and keep down putrefaction without using any agent that weighs down the uterus and so retards its involution.

In his own practice, over a period of more than twenty years, Doctor DeVine has resorted to hot douching of the uterine cavity in cases treated before putrefaction had gone so far as to endanger the uterus by such procedure. He has tried every method recommended by others, but continues to rely upon hot douching, since it is the only way that he has found whereby the uterine cavity can be actually cleansed of loose debris which must be regarded as a dangerous media for the multiplication of organisms present in the uterus.

Where the value of the animal justifies it, the douching is repeated daily until the membranes have either come away or the cervix has closed. He regards the cases that are not presented until five or more days after parturition, and where there is a severe cotyledonitis, as presenting great difficulty and requiring extraordinary care in handling, believing that the administration of stimulants and large doses of bacterins is about all that can be done to advantage for the patient.

In the type of retained placenta where the cervix is closed and the hands cannot be introduced, he relies upon a combination of the other methods, massage of the ovaries, expulsion of the corpora lutei, massage of the uterus, hot douching of the vagina only, and the administration of stimulants and bacterins. He regards massage of the uterus where the inflammation is not so severe as to make this dangerous, a potent means of producing tone in the organ.

Hobday,[11] discussing infectious abortion, summarizes in some measure the results that have been obtained in the United States, and discusses the use of prophylactic measures, stating the advantages and disadvantages of the live vaccine and the bacterin. It would appear that British practitioners rely more upon the live vaccine than we do in America, and as he has done on previous occasions, urges a trial of the "abortoscope" in diagnosis, criticizing to some extent the serological tests because of their lack of standardization.

[11] Accredited Herds—Tuberculosis and Contagious Abortion, by Frederick Hobday. The Veterinary Journal (London), Vol. 83, No. 6, June, 1927.

Abortion in Mares

W. W. Dimock[12] divides abortion in mares into six classes as follows:

1. Contagious abortion due to the presence and action of the *B. abortivo equinus;* diagnosed by the isolation of the organism from the fetus, fetal membranes or uterine discharge, or in two or all of these, and a positive reaction to the agglutination and complement fixation tests. In such cases, other organisms found in the fetus, fetal membranes or uterine discharge are disregarded.

2. Abortion due to infection of the genital tract of the mare and the fetus by *Strept. genitalium.* This is diagnosed when the tests for contagious abortion are negative and the *Strept. genitalium* is isolated from the fetus, fetal membranes and uterine discharge and there is also present cervicitis and metritis. If the mare recovers promptly, it throws doubt on the diagnosis. If the mare recovers slowly, it confirms it. Other organisms present are disregarded.

3. Abortion due to infection of the genital tract by one or more of a number of different microorganisms. This is a sort of group-cause, and not always capable of exact diagnosis. The finding of organisms accompanied by extensive degenerated changes in the genital organs, the absence of B. abortivo equinus and Strept. genitalium, and the exclusion, so far as possible, of other causes is the principal means of diagnosis.

4. Abortion due to accidental injury, fright, strain, exposure, etc. This is re-

[12] Studies on Abortion in Mares, The Diagnosis and Differential Diagnosis of Contagious Abortion, The Results of Vaccination Against Contagious Abortion in Mares, by W. W. Dimock, University of Kentucky. Journal of the American Veterinary Medical Association, Vol. 24, No. 1, April, 1927.

garded as an infrequent cause. The diagnosis is made after all possible infectious and toxic causes have been eliminated and the evidence of an accident substantiated.

5. Abortion due to nutritional disturbances. The diagnosis is reached by the process of elimination of the other possible causes. The compilation of the available evidence, widespread abortion in mares under the same care and on the same feed and a cessation of the abortion immediately upon a change of feed.

6. Abortion due to general debilitated condition, or organic weakness of the uterus or genital tract. This is a rare cause of abortion. The name indicates the factors necessary to its diagnosis, which is reached only after the elimination of all other causes.

In contagious abortion (due to the *B. abortivo equinus*) barring complications, the mare makes a prompt recovery without treatment. In abortion due to other infections, there is usually marked degenerative changes. Metritis will continue for some time and does not, as a rule, recover without treatment. In abortion due to accidental and toxic effects of feed there is an absence of pathologic lesions.

Many foals carried full term are found to be diseased at birth and many foals so diseased, die. In such cases, the dam often is found to be suffering from metritis. Abortion is easily produced in such cases. A study of diseases of foals disclosed some striking analogies with diseases of the genital organs and abortion. Joint-ill or navel-ill due to *B. abortivo equinus. Strept, genitalium,* or *B. viscosum equi* is practically indistinguishable clinically though differing in the lesions found on postmortem examination. *B. Viscosum equi* was not incriminated as a cause of abortion as has been reported by European investigators. It was, however, isolated in fourteen cases from foals suffering from joint-ill and septicemia. All had been carried full term and all died within a week of birth.

A bacterin was prepared from the *B. abortivo equinus* and used as a prophylactic. From 1916 to date, approximately 7,000 mares have been injected, given in some cases two injections, in others three, and in others four. But very few abortions occurred in all this number, and only one that could be attributed to the *B. abortivo equinus.* The bacterin was used to a considerable extent in herds that were aborting, but it requires a period of four weeks to stop the abortions.

The officers in charge of the breeding operations of the United States Remount Depot at Front Royal report a similar experience.

The immunity produced by the bacterin injection is of short duration, lasting only one breeding season. In some thoroughbred stables, the bacterin is used twice a year, soon after foaling and in the early winter; but the author regards its use in the fall, three injections at intervals of one week, as being quite sufficient to prevent contagious abortion in mares.

Nutritional Studies

Leersum,[12] investigating the ordinary raw milk supplied in Amsterdam, discovered that at sixteen hours after milking, its age at delivery, it had lost a large portion of its vitamin C content and was incapable of keeping guinea pigs on a scorbutic diet alive more than seventy-five days. That it still contained some vitamin C was shown by the fact that the pigs lived that long. If wholly deprived of vitamin C they would have succumbed sooner. The pigs maintained their health when fed on grade A milk from the model farm, Oud Bussem, near Amsterdam. This milk was delivered six hours after milking. Pasteurized milk contained even less vitamin C than ordinary raw milk.

Prof. Leersum's investigation convinced him that the loss of vitamin C is due to oxidation, and that the superiority of the Oud Bussem milk in vitamin C content was due to its less exposure to the air,

[12] Vitamin C Content in Raw and in Pasteurized Milk, by Prof. E. C. Van Leersum, M. D., Director of the Netherland Institute of Nutrition, Amsterdam. The Veterinary Journal (London), Vol. 83, No. 5, May, 1927.

and to being used when fresher. He found that milk absorbs a large amount of oxygen from the air, and that by ordinary methods of production and distribution it is exposed to the air unduly. A long exposure in milking, a further exposure in cooling, again in hauling to market when the containers are not usually completely filled, and even in the bottles where a few cc's of air is included.

The heat of pasteurization does not affect the vitamin but the high temperature is more favorable for oxidation and the heating the milk and particularly its cooling offers added opportunity for exposure to air, and so more opportunity for the absorption of oxygen.

Prof. Leersum thinks that it makes little difference whether milk consumed by adults, as is usually the case in small quantities, contains vitamin C (and A) or not, but that this is a matter of very great importance to babies and some others who must depend upon milk for the principal part or all of the food ration. He suggests as a means of retaining the vitamin C that the milk be drawn with a milking machine, that it be not exposed to the air during cooling or hauling, that is that it be kept in vessels entirely filled with milk and that it be used as fresh as possible. Where pasteurized, he would have it protected from the air during pasteurization, and cooled by flowing *through* the tubes instead of on the outside of them.

Strangely, Prof. Leersum makes no reference to the addition of orange juice or tomato juice to the dietary of infants to supply the necessary anti-scorbutic vitamins, a practice so well established in this country that the loss of vitamin C from milk for infant feeding is a matter of little or no concern here. Are we to assume that it is not the general practice in Holland to include orange juice or tomato juice in the infant's dietary?

Perhaps the protection of milk from exposure to the air is worth while on other grounds. We cannot consider it worth the cost to preserve the anti-scorbutic vitamin which may be obtained at less expense from certain fruit juices.

Bighead in Rams

Bull[14] described an undiagnosed ailment occurring in South Australia among uncastrated, male sheep, chiefly merino rams. He has observed the condition for six years, and has noted it to cause serious loss to sheep breeders.

The symptoms consist of an enormous swelling of the head. The lesions on postmortem examination are an intense edema of the subcutaneous structures of the face, extending to some distance on the neck. Submucous structures are also affected. Death is due to suffocation. A few cases, running a chronic course, recover rather promptly from the edema, but this is followed by necrosis of the skin of the head, the ears and cheeks dropping off and wool falls out from other parts of the body.

The disease appears to be spreading. It has been known for some years in New South Wales, but only recently appeared in Western Australia. The occurrence and course of the disease would almost exclude infection as a cause. Theories have been advanced that it is a plant poisoning, a mold poisoning, a photosensitization and that it is a nutritional disease.

Mineral Deficiency

In the matter of mineral deficiency, Forbes[15] finds that calcium, on account of the large amount present in the body and in the milk and because of the characteristics of its compounds as to solubility occupies a dominant or key position in mineral nutrition. He found that heavy milkers suffered a loss of calcium in the skeleton during the first half of the lactation period, in spite of an obviously adequate amount of calcium in the ration—

[14] Notes on Swelled-head or Big-head in Rams with a Discussion on Photosensitization, by L. B. Bull, D.V.Sc., Government Laboratory of Pathology and Bacteriology, Adelaide Hospital, South Australia. The Australian Veterinary Journal, Vol. 3, No. 2, June, 1927.

[15] The Mineral Metabolism of Dairy Cattle and Swine, by E. B. Forbes, Director, Institute of Animal Nutrition, Pennsylvania State College. Proceedings of the 30th Annual Meeting of the United States Live Stock Sanitary Association.

that calcium is lost from the body in all cases of abundant milk producers in spite of calcium intake varying from normal to excessive. When the milk production becomes low and during the rest period, the storage of calcium in the body is very rapid. Storage of calcium even during liberal milk production has been demonstrated under the influence of the antirachitic vitamin of alfalfa hay cured under hayacock covers, and even more liberal calcium storage from green alfalfa. Timothy hay or alfalfa cured for four days in the sunshine resulted in a calcium loss during heavy lactation even when bone meal supplement was fed. He charged that to sell ground limestone as a component of commercial feeds is to hand out a stone in place of bread.

Where animals are fed on alfalfa alone with little or no grain, a deficiency of phosphorus may be a decidedly limiting factor. In certain parts of Minnesota, Texas and Wisconsin, and in extensive regions in South Africa and Australia, the composition of the soil is so deficient in phosphorus as to cause a phosphorus deficiency in the forage and serious disorders in animals fed the forage. Under these conditions of abnormal forage, the feeding of bone meal is of definite value.

It has been shown that a vitamin D deficiency is the cause of rickets and Maynard has gone far toward linking up posterior paralysis of swine with rickets It has been shown that vitamin D is essential to normal mineral metabolism even in the presence of abundant mineral nutriments.

If goitre is present in calves, or sheep, or pigs, or if there is any other reason to suspect iodin deficiency in the feed, a small amount of potassium iodid per day given to the mother during gestation is advantageous.

Owing to the great solubility of iodin salts, the drinking water and not the food is the chief source of iodin in the animal body, and disturbances of function of the thyroid glands such as hairlessness in pigs, lambs and calves and of weakness in colts, occur in districts strikingly corresponding to the areas in which there is an insufficient amount of iodin in the water.

Mineral Deficiency Research

Schalk[16] and other members of the committee on nutritional diseases of the United States Live Stock Sanitary Association, rendered a report reviewing in detail all investigation up to the present time in mineral-vitamin deficiency and the effects of ultraviolet rays on metabolism in cattle, swine and poultry, dealing with these various effects as they pertain to disease and disease resistance. The report is too extensive for a summary within the limits of the space at our disposal.

A number of discussions on the mineral requirements in feeding chickens and the ailments incident to insufficient mineral matter in the ration appeared during the year. One in VETERINARY MEDICINE[17] perhaps may be taken as typical: "The source and amount of protein concentrate may be greatly varied for chickens but the mineral requirement is very exacting and under no circumstances should a ration be allowed to become deficient in the essential minerals."

As to the large amount of mineral matter required for poultry, the following is indicative: "More than one-third of the total dry matter of an egg is mineral matter, chiefly lime of the shell. Hence laying hens not only require the minerals essential for growth and body functions but a large additional supply of lime for egg shells."

Beach[18] and his associates described in a recent bulletin a district in Wisconsin in which cattle suffer from phosphorus deficiency. For ten years and longer, a

[16] Report of the Committee on Nutritional Diseases, by A. F. Schalk, Chairman. Proceedings of the 30th Annual Meeting of the United States Live Stock Sanitary Association.

[17] Mineral and Vitamin Requirement for Chickens, excerpted paragraphs from the Quarterly Bulletin of the Ohio Agricultural Experiment Station. Veterinary Medicine, Vol. 22, No. 6, June, 1927.

[18] Phosphorus Deficiency and A Dairy Cattle "Disease," by E. B. Hart, R. A. Beach, E. J. Delwiche and E. G. Bailey. Agricultural Experiment Station, University of Wisconsin, Bulletin No. 389.

mysterious disease has been observed in Door County, Wisconsin. The cattle affected were young heifers or milking cows; cows with long milking history being most affected.

The typical symptoms are extreme emaciation, stiffness in the hind quarters and also at times in the fore quarters, swollen joints, harshness of the coat, dull eyes, unthrifty condition and perverted appetites. The legs and ribs are easily broken. The animals chew raw bones with eagerness and the milk flow is always considerably decreased.

Since the disorder appeared alike in animals on sweet clover pasture and on ordinary pasture, and also in cattle being fed alfalfa hay in abundance, it was apparent that the disorder was not a lime deficiency, since sweet clover and alfalfa hay are very rich in lime salts.

An experiment was undertaken with six animals, all affected but in different stages of the disease. They were divided into two groups and fed rations containing a liberal phosphorus content. One of the rations contained a goodly quantity of wheat bran and the other steamed bone meal. The improvement in the animals was remarkable in all cases. In three months, they had gained from 200 to 322 pounds each, the stiffness had disappeared, the hides becames loose and supple, the coat smooth and the milk production increased 50 per cent. One animal on each ration received cod liver oil in addition to the wheat bran or the bone meal. There was no apparent advantage in adding cod liver oil to the ration.

This nutritional disease can be prevented in this section by feeding the animals a grain mixture containing 20 to 25 per cent of wheat bran or an equal quantity of linseed meal or cotton seed meal. Steamed bone meal in the grain ration at the rate of 5 to 100, or in the salt at the rate of one pound of bone meal to seven pounds of salt likewise prevents the ailment, which was clearly proved to be an aphosphorosis, or a phosphorus deficiency such as has been reported in sections of Montana, Minnesota, Texas, New Zealand, Australia, large sections of Africa and elsewhere. ——

Light Therapy

During the year quite a number of discussions have appeared on the use of ultraviolet rays in the treatment and prevention of disease in animals. This is referred to as heliotherapy, light therapy, actino-therapy, radiant therapy, irradiation and by similar names. The importance of light therapy in human medicine has been recognized for a number of years and the matter has received a great deal of discussion in medical literature. The effect of the presence or absence of the ultraviolet ray in experimental animals and in caged wild animals has been the subject of some excellent research work. The prevention of leg-weakness in chicks has been demonstrated by irradiation as has an increase in egg-production in hens, and an increase in the anti-rachitic factor (vitamin D) in milk of cows that have been irradiated, etc.

As to its strictly veterinary use, however, in the treatment of sick animals, excepting for a single investigation of its use in mange in dogs, little is known other than what has developed clinically from the limited use of this agent in veterinary practice.

F. H. Stainton[19] in an excellent article dealing with irradiation as a therapeutic agent in small animal practice, gives some history of the discovery and use of ultraviolet rays, and sources and methods of application together with the results of this agent in his hands in the treatment of a number of different ailments.

As a source of the ultraviolet ray, Mr. Stainton sees little difference between the mercury vapor quartz light and the metal core carbon arc light. The light is applied by placing the animal in a position at right angles to the rays and sufficiently near (carbon arc) to receive a comfortable warmth. The eyes are pro-

[19] Ultraviolet Radiation in Veterinary Practice, by F. H. Stainton. Veterinary Medicine, Vol. 22, No. 7, July, 1927.

tected by goggles or the placing of a blanket over the head. The effect of the rays is soothing and restraint is ordinarily not required. The length of exposure varies from two to ten minutes, and is applied either daily or at intervals of two or three days.

Good results were attained in skin affections, ulcers, eczema, parasitisms, etc., in nervous disorders and in malnutrition, including rickets. The effect in distemper, chorea and other systemic diseases not due to nutritional disorders was of doubtful value. Blepharitis, purulent otitis and alopecia are other conditions in which excellent results were obtained by the author from ultraviolet-ray therapy.

J. F. Halls Dally,[20] said: "During the past few years in this country (England) ultraviolet radiation has made great strides. Although it is the youngest member of the ancillary group of medical sciences, on the clinical side it has already proved its worth in an extraordinarily large number of totally different disorders and diseases."

Noback[21] mentioned the fact that radiant energy may be stored in irradiated food, either naturally as occurs in cod liver oil, or due to exposure of food (particularly milk) to artificially produced ultraviolet rays. He describes the use of ultraviolet rays in the treatment of a number of cases of "cage paralysis," rickets, osteitis deformans and osteomalacia in primates in the New York Zoological Park. The result of an average exposure of 30 minutes to ultraviolet rays daily for three weeks was a complete recovery in all cases, although conditions were such as do not respond to any other form of treatment, and have heretofore resulted in the prompt loss of the animals. Irradiated dried whole milk (klim), 10 grams daily, was fed as a preventive of cage paralysis with gratifying success.

John G. Hardenbergh[22] reported an investigation of the effect of ultraviolet ray and infra-red rays in the treatment of a case of demodectic mange in a one-year-old St. Bernard. While the general condition of the animal improved markedly as a result of the irradiation, the course of the disease was not affected. The same treatment was then tried in two mild cases of follicular mange in fox terrier puppies and the parasitism was promptly arrested.

Some experiments were made to determine the effect of the rays on the mange parasites *in vitro*. Exposure to the rays for thirty minutes and to a less degree for a shorter period lowered the thermal death point of the parasites, but even at the lowest, the temperature at which the organisms succumbed was very considerably higher than it would be possible to bring about *in situ* in the animal.

Clinical Experience with Actino-Therapy

Hamilton Kirk,[23] in an extensive paper on actino-therapy in veterinary practice, after a general discussion and a review of the research work heretofore carried out in the matter of actino-therapy gave the following record of his experience with this treatment:

From experimental observations, coupled with theoretical deductions, one might be led to believe that certain disease conditions could not fail to be benefited by exposure to ultraviolet rays. But from clinical experiences I find that this is not so. One case of eczema, for instance, might respond wonderfully to ultraviolet ray while another would not be affected. I have not as yet found an explanation of this phenomenon; but I can state that the practitioner who is

[20] Ultraviolet Radiation in Veterinary Practice, by J. F. Halls Dalley. Veterinary Medicine, Vol. 22, No. 7, July, 1927.

[21] Direct Ultraviolet Irradiation of Five Primates with Cage Paralysis (Rickets), by Charles V. Novack, New York Zoological Park. The Cornell Veterinarian, Vol. 17, No. 3, July, 1927.

[22] The Possible Role of Radiant Therapy in Demodectic Mange, by John G. Hardenbergh and Charles Sheard, Division of Experimental Surgery and Pathology and Section on Physics, The Mayo Foundation. Journal of the American Veterinary Medical Association, Vol. 24, No. 5, August, 1927.

[23] Actino-Therapy in Canine Practice, by Major Hamilton Kirk, M.R.C.V.S., London. The Veterinary Record (London), Vol. 7, No. 24, June 11, 1927.

equipped with an apparatus must just conduct trial treatment and make no definite promises to his clients. There is as yet much to learn, but our technic will improve in due course and our results will be more certain.

The diseases which have been treated successfully by heliotherapy are multifarious, and of all them, perhaps the skin diseases have yielded the most notable results.

Eczema.—Ultraviolet ray has proved a valuable therapeutic agent against this common condition. In chronic cases a third degree erythema is necessary, after two productions of which the pruritus often has disappeared. In acute cases a weaker reaction is more beneficial, and where there are discharges, these must be removed prior to treatment. If possible, it is advisable to treat generally as well as locally, and in obstinate cases as many as twenty exposures may be necessary before a cure can be effected.

I have in mind a bulldog which suffered from weeping eczema about the base of the tail and on the scrotum. Only two applications from a tungsten lamp at twelve inches for five minutes were required to dry these up and stop the irritations. A Sealyham affected with moist eczema of the face apparently obtained no benefit from irradiations (pure tungsten being used). On the day following the first exposure the cheek was found in a state of great edema and tenderness which at first I attributed to an overdose of ultraviolet ray, but which was due probably to traumatism. The part was poulticed with an ointment and the lesion quickly subsided and cleared away.

My office cat developed eczema along the course of the spinal column (a common situation for the disease in cats) and three exposures of five minutes each to an iron-cored carbon lamp subdued the irritability and dried up the lesions very considerably. A fox terrier was entirely cured of eczema after five exposures on consecutive days.

Pruritus yields readily, in most cases, to actinic light.

Acne may be successfully treated by light alone, although it is unwise to neglect other medicinal measures such as diet and the avoidance of constipation.

Boils.—As I have already shown, ultraviolet ray will often abort boils and will at least rob them of pain. Boils and carbuncles represent lowered local and general resistance, so that local and general treatment should simultaneously be given.

Psoriasis.—This disease is rarely found in parts of the body which are normally exposed to sunlight. Cases usually clear up, and Troupe found that nine exposures were sufficient to cure a case two years old. He gave local and general treatment.

Urticaria.—The severe itching of urticaria is relieved almost at once by ultraviolet ray.

Chronic Indolent Ulcers, from any cause, are greatly benefited by second degree stimulation of an arc lamp. The effect is due not only to the bactericidal properties of the rays, but to their stimulation of epithelial and granular tissue growth. Of course, bacterial necrosis, so often seen in cats, would come under this heading.

Pruritus Ani.—This is a condition very peculiar to dogs, and if one can ascertain no removable cause for it, the exposure of the anal region at twelve inches distance for from three to five minutes will frequently subdue all irritation. The parts must necessarily be denuded of hair and excrement before exposure to the rays. I treated a case in a Pekingese only two days ago, giving ten minutes' exposure at a foot distance. The pruritus in this instance disappeared after one dose.

Alopecia.—For the cure of localized alopecia, probably as many as twenty-four exposures will be necessary to effect a new growth of hair. It has been repeatedly noticed how rapidly healthy hair will grow under the influence of ultraviolet ray, should it happen to remain uncovered during treatment.

Ringworm.—Obstinate cases of ringworm were often eventually disposed of by exposure to ex-rays. This is not now considered so good as ultraviolet because, whilst

the latter kills the fungus and not the hair, x-ray sometimes kills both.

Follicular Mange.—No success has been attained in these cases, and although in an Aberdeen terrier with a localized lesion on the neck I produced a third degree erythema, the disease pursued its normal course.

Sarcoptic Mange.—On the other hand, Russell records a case of mange in a cat which was cured by ten applications of ultraviolet, no other therapy being employed. I have grave doubts, however, as to the manner in which the cure in this case was effected. The parasites were not demonstrated.

Finally, I may be excused, perhaps, for mentioning that in the human being, chilblains, impetigo, shingles, ex-ray dermatitis and lupus have yielded splendid results from exposure to ultraviolet rays. *Chilblains,* which are thought to be due to defective peripheral circulation and lack of calcium, are quickly amenable to light treatment. *Impetigo,* as I have personally discovered, is soon curable, for I treated the son of a veterinary surgeon who had suffered from it for eight months until he came to me. He received daily exposures of tungsten light at ten inches distance first for three, then four, and finally nine-minute periods, over fourteen days, and was then quite healed. A Colonial appointment might have been denied him had he not recovered quickly.

As to *shingles,* its average duration without ultraviolet ray treatment is five weeks. With the rays it is five to ten days and the disease can always be cured, without exception.

Against *x-ray dermatitis,* ultraviolet rays are the recognized cure. Finssen was the first to employ ultraviolet rays for the treatment of *lupus,* and he used a carbon arc lamp with great success. He produced a fourth degree reaction so as to destroy the diseased tissue and promote the growth of healthy tissue. General irradiation was also carried out, and Dr. Sequeira, of the London Hospital, states that the percentage of cures is now 60 to 90 per cent.

One may perhaps be pardoned for introducing medical practice into a veterinary paper, when I state that my object is merely to show what a power for good is wielded by these invisible rays in conditions other than those *we* are accustomed to treat.

Pyorrhea.—I have the most authentic evidence from dentists that many cases of pyorrhea have in their practices been permanently cured. Receding gums have contracted and loose teeth tightened, whilst pus in the alveolus has eventually disappeared. I had a shocking case two weeks ago in a ten-year-old Yorkshire terrier, and although I commenced ultraviolet ray treatment, I soon realized in that instance that nine extractions were inevitable.

Generally, then, in all skin diseases it will be seen that a second or third degree of reaction must be produced for successful results to ensue. The great thing is "antisepticism" and as every surface exposed is rendered antiseptic (with certain wave lengths) the reason of its success is made plainer. In all cases, too, general as well as local irradiation is the better plan.

Rickets is a condition upon which much work has been done, and most extraordinary results have been obtained by the use of ultraviolet. For children it is practically a specific. For dogs it is not so easy to apply, though equally efficacious. I have just been treating a Great Dane puppy for distemper and advanced rickets. The dog had all the hair clipped from the sterno-abdominal surface, and was irradiated five times for fifteen minutes each. In addition, it received 1/10 gr. parathyroid gland and v. gr. calcium lactate twice daily, and a ration of 3 lbs. of raw meat. At the end of three weeks in my hospital the improvement was really remarkable.

The calcium and phosphorus content in the blood is responsible in great measure for the integrity of bone structure and the growth and calcification of the skeleton. Ultraviolet increases the calcium and phosphorus content by extracting these salts from the bowel. It is, therefore, logical simultaneously to feed these salts to the affected animal. Ultraviolet ray activates the endocrine glands, and in this additional way ensures the production of anti-rachitic substances.

Rheumatic manifestations are all greatly benefited by ultraviolet, and, in man, early

cases of lumbago may be cured by even two applications. Stubborn cases will yield after a course of about twelve treatments. Rheumatism and rheumatic arthritis can be arrested in their progress, although it is desirable to combine other forms of treatment. If septic foci exist, these must of course be removed.

In sprains the length of treatment can be reduced very considerably provided that a sharp reaction is produced. This should be of particular interest to veterinary surgeons in charge of racing stables and might be very well worth trying.

Otorrhea and Otitis are both improved and sometimes cured by actino-therapy.

Burns of all kinds heal much more quickly if given small and frequent doses of ultra-violet light.

Time will unfortunately not permit of further enlargement upon the diseases which may be dealt with by actino-therapy, so that I will be content merely to enumerate some of the remainder as follows: Tuberculosis, whether generalized or of joints or glands; sciatica; gastric and duodenal ulcers; colitis; cirrhosis of the liver; chorea; neuralgia; neurasthenia; anemia; leukemia; colds; asthma; bronchitis; general debility, and many more.

All things considered, it seems to me that the lamp which is of greatest utility to the veterinary surgeon is the tungsten arc lamp. They are similar to the arc lamps used in cinematography; the arc is open and the consumption of current is low.

Mercury vapor lamps may be used either on direct or alternating currents, although for use on the latter, an auxiliary apparatus known as a rectifier is required.

I advise the beginner to equip himself at first with an open arc lamp. Having mastered this, he will then soon launch into deeper realms of actino-therapy; that is, if he becomes an enthusiast and can afford to indulge his thirst for further knowledge. As a matter of fact, such an apparatus should soon be able to pay for itself, because treatment by it becomes an extra on all accounts.

The Pasteurization of Milk

The active discussion of the advantages and disadvantages of pasteurization of milk has occupied less space in the veterinary literature of this year than it occupied in previous years, that is in American veterinary publications. In British veterinary publications, more attention was given to this subject than heretofore. The conclusion of the medical profession and that of a considerable group of veterinarians engaged in public health work, as municipal milk inspectors and in similar capacities, is succinctly stated in the leading medical journal.[24]

Few modern public health measures have so completely won the confidence of sanitarians as the pasteurization of milk. The public health laboratory worker has satisfied himself that in a properly constructed and operated pasteurizing machine the ordinary pathogenic germs at all likely to be found in milk, including the tubercle bacillus, are surely destroyed.

The practical health official has observed that, since the general introductions of pasteurization, there has been an almost entire disappearance of typhoid, septic sore throat, scarlet fever and diphtheria due to milk-borne infection.

At present there is hardly any milk-borne disease in the United States save in the smaller towns and rural districts still using raw milk. The relatively insignificant number of milk-borne outbreaks of disease in large cities in recent years have been without exception traced to that small fraction of the total milk supply that is delivered in the raw state.

The experience with raw milk in Montreal[25] forcibly recalled the dangerous condition from which the whole country has recently emerged. Some sanitary authorities have been tempted to regard the recent amazing decline in typhoid in large

[24] The Pasteurization of Milk. Editorial. Journal of the American Medical Association, Vol. 89, No. 17, October 22, 1927.

[25] Report of Board on Typhoid in Montreal, General News, Journal of the American Medical Association, Vol. 89, No. 3, July 16, 1927. See also The Montreal Typhoid Fever Outbreak of 1927. Editorial in Veterinary Medicine, Vol. 22, No. 10, October, 1927.

cities as due to the improvement in water supply that has been brought about through chlorination and filtration; there is no gainsaying that this has been an important factor. It must be remembered, however, that an improvement in the milk supply has been going on over this period and that both reforms must be given large credit for the reduction of disease. It is not possible to determine, and from a practical standpoint it is not significant, precisely how the credit should be apportioned.

In the actual carrying out of the pasteurizing process it is apparent now, as it always has been in sanitary matters, that eternal vigilance is the price of safety. Inattention to the proper operation of a pasteurizer may open the doors wide to serious infection. Since the whole point of the process consists in the destruction of living microbes by heat, it is plain that in order to secure efficiency all of the milk should be exposed to the killing temperature. Current legal and extra-legal definitions of pasteurization emphasize the necessity of exposing "every particle of milk" or "every portion of the milk" to the chosen temperature. Recent careful examination by engineers of many types of pasteurizing machines has shown that even in the modern holding type of machine, now almost universally used, mechanical defects in the way of dead ends, leaky valves or unsatisfactory thermometers can sometimes be observed. The faults shown by inspection have been confirmed by detailed bacteriologic studies. Although it is difficult to secure epidemiologic evidence that mechanical defects in pasteurizers have actually led to specific contamination, there is no doubt that the possibility of infection from this source should be recognized and blocked. During the past year or so much effort has been devoted to the discovery and remedying of these mechanical defects, and great progress has been made, as shown especially in the notable studies of the Chicago Department of Health and the U. S. Public Health Service.

Temperatures higher than from 142 to 143 F. would seem to be necessary only if there is lack of uniformity or regularity in the heating process. Since the destruction of the cream line is the cause of great objection on the part of the consumers and tends to create prejudice against the pasteurizing process, it is to be hoped that the work now proceeding rapidly in rehabilitating pasteurizing apparatus will be successful and allow the use of the lowest temperature that is thoroughly consonant with safety.

The early prejudice among nutritional experts against pasteurized milk has largely melted away. Proper pasteurization does not injuriously affect taste, appearance or digestibility; on the contrary, the tendency of heat to make the curds smaller is perhaps an aid to digestion. Some observers at one time were inclined to lay stress on the undoubted diminution in the antiscorbutic vitamins that is caused by heating. At the present day this gives little concern since the inclusion—now usual—in the infant's dietary of orange juice or tomato juice entirely meets this objection.

On the whole, modern well controlled pasteurization marks a distinct sanitary advance.

Pasteurization Meets Opposition In Europe

C. Maddock[26] well states the position of many public health workers including a substantial body of veterinarians in Great Britain who hold serious doubts that the advantages of pasteurization outweigh their disadvantages, and gives considerable evidence to support his position, which is shown by the following:

Recent work at the National Institute for Research in Dairying confirms the view that pasteurization of naturally infected tubercular milk does not invariably kill the tubercle bacillus.

[26] The Effect of Pasteurization on Milk, by Lt. Col. C. Maddock, Hon. Sec., "Grade A (Tuberculin Tested)" Milk Producers' Association, Reading. The Veterinary Journal (London), Vol. 83, No. 7, July, 1927.

The question of the destruction of vitamins by pasteurization is a very difficult one to solve. As our knowledge of vitamins increases so does the complexity of the question.

That outbreaks of scurvy have taken place following on the establishment of large pasteurization plants, has been shown by A. F. Hess in his work on Scurvy, Past and Present, notably in Berlin in 1901, and when pasteurized homogenized milk was introduced into Switzerland and France. He also states that the condition of latent scurvy is probably the commonest type of this disorder, especially in the larger cities where almost the entire milk supply for infants is pasteurized, and when we consider that the disease takes six to nine months to develop.

A very interesting observation by M. Ludd, H. W. Ewarts and L. W. Franks in New York, on infant feeding was carried out for over six months. The infants were divided into four groups, the first were fed on pasteurized milk alone, the second on pasteurized milk plus orange juice, the third on pasteurized milk plus orange juice and cod liver oil, and the fourth on certified milk which was the only raw milk obtainable in New York. The percentage gain in weights of these different groups showed that those fed on pasteurized milk alone had gained 1.7 per cent in weight, with pasteurized milk plus orange juice, the gain was 7.9 per cent, with pasteurized milk plus orange juice and cod liver oil the gain was 9.5 per cent, while those fed on raw milk gained 14 per cent in weight.

I am convinced that raw fresh milk has an extraordinary effect on increasing the appetite.

As Nature gave raw fresh milk as the only diet for the offspring of all mammals, I still believe that when man steps in and interferes with nature that some harm must ensue, and that it is only a matter of time before research work will prove this still more definitely.

Ascaris in Pigs in Louisiana

Harry Morris[27] gives the result of an interesting investigation into the economic value of treating pigs in Louisiana for round worms. He says:

In order to obtain specific information concerning the value of round worm control in suckling pigs, a uniform litter of six pigs was selected for this work. At the age of one month, four pigs were given, as direction called for, commercially prepared capsules which contained as a base oil of chenopodium. The two remaining pigs were not treated. At the end of fourteen days the pigs receiving the original treatment were again administered worm capsules.

The entire litter received the same care, feed, and attention. They had the run of a grass lot and were fed in self-feeder, the free-choice system. The feed consisted of rice polish, rice bran and tankage. They also had free access to clean water and a mineral mixture composed of: 10 parts by weight wood ashes, 10 parts by weight of 16 per cent acid phosphate, and one part by weight of common salt.

No special feed lot sanitation was exercised, but the pigs had comfortable surroundings. The general sanitary condition of the lot was above average. As mud holes were made they were filled with dirt.

The four pigs which received the worm treatment maintained a good steady growth and development. On the other hand, the two pigs which were not treated soon developed all the symptoms of round worm infestation. The appetite soon became impaired, the hair coat became rough and dull, eyes lusterless, back humped, tail straight, pot-bellied (in the early stages), and a general condition of unthriftiness. Both pigs had, in addition, a chronic cough which was due to the presence of the small round worms in the lungs. One pig developed a typical worm pneumonia with the characteristic

[27] It Pays to Worm Pigs, by J. B. Francioni, Jr., and Harry Morris. Louisiana State University and Agricultural and Mechanical College Extension Circular No. 96.

thumps and died. The other pig, when killed, was in the last stage of parasitism. Postmortem examination of both pigs revealed no symptoms of any infectious diseases.

One of the treated pigs and the surviving untreated pig were subjected to further examination. The postmortem examination on the untreated pig revealed 70 specimens of the round worms *Ascaris lumbricoides*. The weight of these two pigs on foot was for the treated pig 82 pounds; of the untreated pig, 10¾ pounds. The carcass of the treated pig had a value of $8.00 with a possible value of only $1.00 for the untreated pig, although actually in this case the flesh was condemned as unfit for human consumption.

This experiment of Doctor Morris' to a considerable extent, overturns the theory upon which the McLean County system is based. The theory of the McLean County system, is that the round worm is harmful to pigs chiefly in the larval stage, and that the essential thing is to prevent pigs from ingesting ascaris eggs. Doctor Morris by his anthelmintics eliminated the adult worms from the intestines of the pigs after they had passed the larval stage in the lungs.

The soundness of the theory upon which the McLean County system is based has been abundantly confirmed by research work and widely substantiated by results in the field. However, if results approximating those obtained by the McLean County system can be obtained by merely administering to the pigs two doses of anthelmintics, it would appear to be a great advantage over the McLean County System which adds considerable to the labor and expense of rearing pigs, i.e., for individual farrowing houses, the change of pens, feeding the sows separately, etc.

Doctor Morris should repeat his experiments and on a larger scale. It seems scarcely possible that thumps, pneumonia and runty pigs—the effects of ascaris larvae infestation—can be avoided where pigs are permitted to ingest the eggs.

Coccidiosis and Tapeworm of Poultry

E. L. Stubbs[28] in discussing investigations made in Pennsylvania as to the occurrence and an effective treatment for parasites in poultry, states:

The poultry industry is suffering greatly from the ravages of coccidiosis and tapeworm infestation. Poultrymen and veterinarians are confronted everywhere with problems pertaining to these parasitisms. Direct losses from these troubles are high and indirect losses are enormous.

Coccidiosis is the most fatal disease of growing chicks and is dreaded by all poultrymen. It is most prevalent and most dangerous in chicks from the ages of three weeks to three months. Older chickens frequently show large numbers of coccidia and it is believed much damage is done to older chickens.

Tapeworm infestation occurs somewhat later. It is more insidious, more widespread, and is believed to be one of the greatest problems of the poultry keeper. Each condition, while doing the greatest damage to young fowl, brings about after effects which are felt throughout the entire existence of affected fowls and flocks.

Flocks which sustain losses from coccidiosis or tapeworm infestation or both are rarely profitable and they are a constant source of trouble. Coccidiosis is due to a protozoan parasite — *Eimeria avium*. There are several varieties of tapeworm that infest chickens; each variety has its own intermediate hosts and individual peculiarities. Some are very small, microscopic in size, as the *Davainea proglottina* and some are large as the *Choanotaenia infundibuliformis*.

Coccidiosis is commonly diagnosed by bloody droppings, enlarged ceca, inflamed mucous membranes and the presence of large numbers of oocysts or the cyst stage of coccidia.

Tapeworm infestation may not be no-

[28] The Control of Coccidiosis and Tapeworms in Poultry, by E. L. Stubbs, Pennsylvania, Bureau of Animal Industry. The Cornell Veterinarian, Vol. 17, No. 2, April, 1927.

ticed if light, while moderate to heavy infestation usually caused marked disturbances—depraved appetite, great desire for water, restlessness, uneasiness, diarrhea and unthriftiness.

J. R. Beach of California had success in the treatment and prevention of coccidiosis by maintaining a high acid condition with the intestinal tract (noted January issue VETERINARY MEDICINE, page 25, 1927). This was accomplished by feeding a mash comprising 40 per cent of dry skimmed milk.

Hall and Shillinger advocate Kamala as a satisfactory anthelmintic for tapeworms in chickens. They recommend one gram per bird, neither fasting nor purgation were necessary. The treatment is safe in as much as chickens will tolerate doses of six, eight or even ten grams of kamala without bad effect. However, kamala, like other excellent anthelmintics, will occasionally fail to remove all of the tapeworms.

W. L. Chandler of Michigan recommends the use of colloidal iodin administered with a syringe through a catheter passed down the esophagus.

The prevention of coccidiosis consists in preventing the contamination of feed and water with the feces of infected birds.

The prevention of tapeworm consists in preventing the chickens from eating the intermediate hosts, flys, snails, etc., or preventing access of these hosts to the feces of infected birds.

Viability of Parasite Eggs

H. B. Raffensperger[29] reports an investigation as to the length of time the eggs of the *Ascaris suum* would remain viable under normal conditions of exposure in hog lots and hog pastures. The results indicated that a period of one year may not be sufficient to destroy the viability of all Ascaris suum eggs under the weather conditions of northern Illinois.

[29] Viability of Ascaris Suum Ova Exposed to Weather Conditions, by H. B. Raffensperger, Zoological Division, Bureau of Animal Industry, Chicago. Veterinary Medicine, Vol. 22, No. 6, June, 1927.

The Practitioner's Part in Parasite Control

Without a doubt to the practitioner, the most valuable contribution on the subject of control of parasites in animals during the year, was made by J. E. Shillinger.[30] He dealt with many phases of these problems in the various domesticated animals as they are presented to the practicing veterinarian, stating that in the control of animal parasites both external and internal, one has to take into consideration two phases of the problem. First, that of treating infested animals, and second, that of removing opportunity for reinfestation. Both problems are confronted with difficulties, many of which cannot be foreseen, hence the need for flexibility in rules of procedure.

Among the external parasites, lice and flees offer the least difficulty of control. Nicotin, coal tar, creosote and arsenical dips are effective for lice of all kinds; but as they cannot be depended upon to destroy the eggs, a repetition of the treatment in fourteen to sixteen days is required. All of these preparations are poisonous and may do harm by absorption or if ingested.

Mange offers more difficulty in treatment because the parasites burrow under the skin, but lime and sulphur and nicotin dips are very effective for the treatment of the more superficial forms of mange in the large animals.

The control of sarcoptic mange in dogs may be accomplished fairly easily by the use of lime and sulphur dip.

Liquid oil of tar in repeated applications of about six days apart, is one of the most effective treatments that has yet been tried for the control of demodectic mange in dogs. Its thin consistency, good spreading and high penetrating combined with low toxicity forms a desirable combination of qualities for this purpose. It should be mentioned, however, that liquid oil of tar is somewhat difficult to

[30] Practical Control Measures for Parasites, by J. E. Shillinger, Associate Veterinarian, Food, Drug, and Insecticide Administration, U. S. Department of Agriculture. Veterinary Medicine, Vol. 22, No. 10, October, 1927.

obtain. Even the large wholesale druggists sometimes supply tar when oil of liquid tar is ordered. In any case, one who expects a high percentage of cures of demodectic mange is due for disappointment.

Internal parasites offer still more difficulties in treatment. Due to the many complicating factors, we seldom see 100 per cent efficiency in anthelmintic medication.

Bot-fly larvae infestation in horses is readily overcome by the administration of carbon disulphid after the animals have fasted for twenty-four hours. In treating horses for the blood sucking strongyles, carbon tetrachlorid has been found to be a practical anthelmintic in doses of about 25 cc. It probably has less injurious effects than is occasionally reported from the use of oil of chenopodium.

The treatment of stomach worms, *Hemonchus contortus,* in calves and lambs is satisfactorily accomplished by the administration of three ounces of a one per cent solution of copper sulphate to a yearling lamb and to other sizes in proportion.

Carbon tetrachlorid in doses of 5 cc. poured into a number eleven capsule previously filled with dry magnesium sulphate is very efficacious in the treatment of stomach worms and has the added advantage of helping to control nodular worms, the various species of small tricostrongyles, and the larger thin necked strongyles. Treatment of stomach worms needs to be repeated at short intervals, at the longest not more than twenty-one days.

Since we have acquired a knowledge of the complete life history of the ascarid of swine, control measures other than medication have been devised. Oral medication of swine is a laborious and disagreeable task.

Oil of chenopodium is the most important of the tested drugs for the removal of ascarids from swine. This drug, at the rate of one drop for each two pounds of live weight of the animals, accompanied by two to four ounces of castor oil, is the most efficacious single treatment known.

For the removal of ascarids from dogs and cats, oil of chenopodium has been found to be the most efficacious, given on an empty stomach at the rate of 0.1 cc. per kilogram of weight and followed immediately with a dose of castor oil appropriate to the size of the animal to produce active purgation. Serious consequences seldom follow.

None of these drugs is dependable for hook worm infestation, but a very efficacious treatment is available in tetrachlorethylene in doses of 0.2 cc. per kilogram weight of the animal. It should be used without purgation following.

In dealing with tapeworms it is difficult to obtain a high degree of efficiency with one treatment. After testing many substances, it has been found that arecolin hydrobromid in doses of one-fourth to three-fourths of a grain is reasonably efficacious.

We recognize the value of the microscope in making a positive diagnosis of parasites, both external and internal. The equipment need not be elaborate nor expensive and the technic employed in finding diagnostic evidence may be very simple but effective. Precise and positive methods on the part of professional men are becoming more and more appreciated by the laymen and such practices when employed will be made a means of increasing one's income.

Treating Horses for Gastrophilus Intestinalis

J. W. McGinnis[31] in a discussion at the meeting of the Missouri Valley Veterinary Medical Association, related an instance of how a veterinarian may add materially to his income and render an exceedingly valuable service to his clients by treating horses in the early spring for the elimination of bots. After carrying out this procedure for two or three years, Doctor McGinnis last spring found he was called upon to treat more than 3,000 horses, for which he re-

[31] Treating 3,000 Horses to Eliminate Bots, by J. W. McGinnis. Veterinary Medicine, Vol. 22, No. 9, September, 1927.

ceived an average of 75 cents per head. This work was accomplished in February, March and early April and did not interfere with his regular practice. The horse owners in his vicinity find it very profitable to have their animals treated for bots before the beginning of the spring work.

Ringworm

Jacob L. Hartman[32] in an interesting paper, discussed the organisms causing dermatomycoses in the horse, the most important of which is the *Trichophyton equinum,* the *Trichophyton granulosum* and the *Microsporum equinum,* which gives rise to tinea or the various forms of ringworm.

He finds that the incubation period is probably frequently longer than twenty-one days. Hence the twenty-one day quarantine period required by army regulations for horses added to an organization, is insufficient to detect all the incubative cases of ringworm.

Divers and sundry treatments have been recommended for ringworm in the horse and include tincture of iodin, salicylic acid in various forms, sulfuric acid ointment, bichlorid of mercury in linseed oil and many other preparations. Thymol in alcohol has been found useful, especially when the discoloration of the hair with iodin is not desired. One veterinarian stated that very good results were obtained with white lotion, and another has reported a cure with ichthyol ointment after all treatments had failed. The parasite is in the hair follicles, therefore, the application to be of benefit must reach the seat of infection. To render this possible the hair should be shaved, or at least clipped. As many cases tend to spontaneous recovery in a month or two, one should be cautious in giving credit to a favored drug unless its value is proved. This will be emphasized when one meets an obstinate case which seems to respond to no treatment and clears up only after a definite course is run. Tinea is especially common in young horses during the winter and spring. Animals turned out on grass in the spring often recover without any treatment.

James L. Barringer[33] also contributes an interesting article on the subject of ringworm in which he gives the following:

In the last two years reports of outbreaks of ringworm have been received from many army posts and animals have been received direct from purchase with lesions of this disease. In fact, it has been almost impossible to purchase horses or mules in the southern zone that were free from visible lesions or that were not contacts.

Where a dipping vat is available, it is a comparatively easy matter to control the disease, as, according to our experience, the lime and sulphur dip if made in the manner described in army regulations and if held at a specific gravity of 1.026 and used at a temperature of 105° to 110° F. is most efficacious. The animals should be dipped at least once a week or oftener until a fine hair has covered the denuded areas.

Unfortunately, dipping vats are not always available, and during the winter months this method of treatment may prove to cause more harm than the disease, therefore other methods must be resorted to. It has been our experience that the fungus is very easily destroyed when the proper medicinal agents are brought into contact with it, but in doing this, two things are of paramount importance: First, locating all the lesions; this includes those that are known to be ringworm and all others that are even slightly suspected of being ringworm, and then applying the proper agent so that it comes into direct contact with the causative organism.

In locating the lesions the animals should be clipped whenever possible. On an unclipped animal the large lesions may be visible, but the smaller ones may pass detection until they have assumed a comparatively large size and in the meantime have distributed the infection to other parts and to other animals. If for some reason it is impossible or impracticable to clip, one may locate the small lesions by a careful palpa-

[32] Ringworm, by Capt. Jacob L. Hartman, V.C. Veterinary Bulletin, for the Veterinary Corps, Medical Department, U. S. Army, Vol. 19, No. 4, April 13, 1927.

[33] Treatment of Ringworm at Reno Q. M. I. D., by Capt. James L. Barringer, V.C. Veterinary Bulletin, for the Veterinary Corps, Medical Department, U. S. Army. Vol. 20, No. 2, August 10, 1927.

tion of the animal body and considering any small mass matted together in a scab as a possible lesion. If the animal is clipped, the small as well as the large areas of infection are visible and there is no possibility of overlooking a small lesion if care is exercised.

The typical lesion of tinea tonsurans is covered with a thick heavy scab that contains all the hair in that area. This scab may be readily lifted off and discloses a moist, red, sharply circumscribed area. As the disease progresses this scab drops off and leaves an area covered with a crusty formation. It is obvious that to obtain results it is necessary to remove the scab or crust that covers the lesion and fungi. This is readily accomplished by means of a curry comb. Several combs should be used, keeping them at all times in a 5 per cent solution of liquor cresolis, and using a different comb on each animal.

There are many agents that will accomplish a cure, and it is only necessary to consider the number of animals to be treated and the rapidity with which it can be applied efficaciously, and also the cost of the drug. Where only a few animals are infected tincture of iodin or iodin and salicylic acid may be used, but where there are many cases, this drug is too expensive and the application is too slow. We have used the standard lime-and-sulphur dip properly heated and applied with a hand brush to which a handle has been attached with excellent results. Another remedy that we have found very efficacious is:

Mercury bichlorid	2.
Tincture iodin	50.
Oleum gospii seminis qs.....	1000.

The mercury is dissolved in the tincture of iodin and together mixed with the oil. The mixture to be shaken thoroughly before applying. This is also applied with a hand brush after the scabs have been removed with curry combs. It should be scrubbed thoroughly into the lesion and the adjacent parts. It destroys the fungi and in addition remains on the skin and hair in contact with the lesion for a length of time. Either of these two treatments should be applied once or twice a week until the denuded areas are haired out.

Ringworm should be treated as are other infectious diseases, using all methods of segregation, quarantine and disinfection. Laboratory diagnosis should not be relied upon too completely. The fungus is difficult to locate and a negative report does not indicate that the causative agent is not present.

Coccidiosis in Cattle

Walter Wisnicky,[34] in reporting an experience with this disease at a meeting of the Wisconsin Veterinary association, says:

Coccidiosis, or red dysentery of cattle is a disease preferably of young animals, generally occurring as an enzootic affection and is caused by the protozoan organism, *Eimeria zurni.*

It appears from a review of the literature that the disease occurs more frequently in this country than is generally supposed.

In November 1926, a yearling heifer at the University of Wisconsin was observed to be passing bloody feces for several days. A microscopic examination of the fecal material revealed the presence of numerous coccidia and a diagnosis of coccidiosis or red dysentery was made. The infected animal was immediately isolated and treated.

The incubation period is thought to be about three weeks but occasionally symptoms may appear after six or eight days.

Blood mixed with the feces is the most obvious symptom. Straining, at times violent, usually occurs. In most cases a bloody diarrhea ensues, but in some instances the feces are not liquid even though a large amount of clotted blood is present. The temperature is normal unless secondary infection occurs by way of the denuded mucous membranes. The appetite usually remains fair in the first stages of the disease. In grave cases, especially in young animals, there is a rapid deterioration in conditions, straining becomes more intense, the animal gradually becomes weaker and anemic and death ensues.

As a prophylactic measure, cattle should not be allowed access of contaminated water,

[34] Coccidiosis in Cattle, by Walter Wisnicky, Wisconsin Agricultural Experiment Station. Veterinary Medicine, Vol. 22, No. 5, May, 1927.

pastures, or feed. Upon discovery of the disease, the infected animals should be isolated and all the droppings burned or thoroughly soaked with a 3% sulphuric acid solution. Coccidia are very resistant to heat, cold and disinfectants, and ordinary sanitary measures are not sufficient to destroy the excreted coccidal oöcysts.

The treatment is largely symptomatic and prophylactic. The line of treatment usually employed consists of intestinal antiseptics, astringents, enemas and tonics. A treatment that has been reported to give good results is equal parts of tannic and salicylic acids, one-half to one ounce doses daily per os. Also one-half to one ounce doses of formalin, creolin or other intestinal antiseptic may be given orally each day.

Rectal injections of a solution containing one per cent alum and one per cent tannic acid are said to have given excellent results.

In cases of severe tenesmus, laudanum in one-half to two-ounce doses may be employed.

The Inadequate Number of Replacements for the Veterinary Profession

The shortage of veterinary students at the eleven veterinary colleges in North America has been a subject of discussion and concern for half a dozen years. The great falling off in the number of enrolled veterinary students as a result of closing the private veterinary colleges in the two years succeeding the World War, was looked upon by many as desirable in that it would give an opportunity for the demand for veterinary service to catch up with the supply of veterinarians; but when the shortage continued year after year without any increase, and in fact with an actual decrease in the number of veterinary students at the remaining veterinary colleges, it was, and is, viewed by many leaders in the profession with grave concern; and with forebodings as to its effect on the veterinary profession in the not distant future.

There is not yet in prospect a sufficient number of veterinary students to replace those quitting the veterinary profession in the natural course, during the next five years. The graduates in 1926 numbered only 113, and in 1927, 117. The present enrollment in the veterinary colleges will not add more than 25 to this number for 1928.

The exact number of veterinarians who leave the profession annually because of going into other lines of work, retiring or because of death, is not accurately known, but few place the number at less than 7%. This would be according all graduates of veterinary colleges an average professional career of fourteen years. Possibly this is an under statement, but we think not materially so. On the other hand, a decrease of 7% annually in the veterinary profession can hardly be adequate because, owing to the light accessions during the past six years, the average age of the members of the profession has increased materially.

Further, there is the influence of the non-graduate still in practice in considerable numbers in a good many of the states. In New York, Illinois, Iowa, Pennsylvania and many other states, few or none of this class have begun practice within a generation, and because of advancing years the mortality rate must be very high among them. Perhaps not a half dozen states have permitted the registration of non-graduates in a decade, and such as have are states where the total number of veterinary practitioners, both graduate and non-graduate is small, in most instances perhaps less than 100.

There are probably still rather more than 10,000 engaged in the various lines of veterinary work. On the basis of 7%, this would mean the withdrawal of 700 annually from the profession, approximately six times the number added to the profession by graduates of veterinary colleges. The replacement required in the large force of veterinarians employed in the Bureau of Animal Industry is greater than 7%; in fact, it is 10%, but not all of this represents withdrawals from veterinary activity. A portion goes into state and municipal veterinary employment.

Since the Bureau of Animal Industry maintains its quota and none of the state or municipal veterinary positions are long vacant, it follows that the entire decrease in numbers occurs in the field of practice.

[35] Few Veterinary Graduates in 1926, Editorial, Columbia Farmer, Missouri. Veterinary Medicine, Vol. 22, No. 1, January, 1927.

Commenting on the 113 graduates of 1926, the Columbia Farmer,[35] states:

So far as we can learn, three of these recent graduates have located in the state of Illinois, to engage in practice, and one in Missouri. On the other hand, a large number of men who are engaged in practice have given it up to follow some other occupation. A large number of veterinarians now in practice are looking for some other opening, and would quit immediately if other profitable employment could be found. In short, the number of veterinarians in actual practice is constantly and quite rapidly decreasing. Some of the older men are retiring. The younger and middle-aged men are taking up sidelines or looking for a complete change to some other occupations. Few are joining the ranks. In a comparatively few years competent veterinarians are apt to be scarce.

M. H. Reynolds[36] has contributed the most comprehensive study yet offered of the reason for the shortage of veterinary students and the remedy for the shortage.

He shows by statistics that the total number of veterinary students in all the veterinary colleges in North America decreased yearly from 759 in 1920 to 570 in 1926, but showed a slight gain in 1927, the number being 598. The number of students in other professions and in agriculture decreased largely immediately following the War, but among veterinary students alone has the decrease continued until the present time.

After going at length into the increase during recent years in the students pursuing courses in agriculture, in medicine and in theology, Doctor Reynolds reaches the conclusion that the number of students taking up any and all lines of work is entirely dependent upon the cost and the reward. In regular medicine, the entrance requirements are very high. Requirements for graduation are rigid. Yet, the demand for medical training far exceeds the capacity of the colleges to supply it. Doctor Reynolds believes this is because of the reward. Financially and socially the reward to the young medical graduate is large and there is prospect that it will be improved. In the ministry of recent years, the reward in the way of higher salaries, more secure positions and retirement pay have been largely increased with the result that the number of students in theological schools has largely increased.

During the past twenty years the entrance requirements for veterinary colleges have been materially raised, the course substantially lengthened and the cost in time and money greatly increased. Reynolds thinks there has been no proportionate increase in the rewards. He regards profitable agriculture in this country as an absolute necessity to national welfare; a profitable animal husbandry as a prerequisite for profitable agriculture; and a profitable animal husbandry impossible without a satisfactory veterinary service. There can be no continued satisfactory veterinary service without veterinarians in larger numbers than are now being turned out by our colleges. The remedy Doctor Reynolds points out is that the cost of veterinary education in time and money must be decreased or the reward for the veterinary graduate, financial or social or both, must be increased and that failure to remedy this matter the one or the other way, or in a combination of both ways, is going to be very costly for the agriculture and for the country.

W. C. Van Allstyne,[37] in a long discussion of the failure of replacement in the veterinary profession, regards the cause as being the same as that named by Doctor Reynolds, but the remedy he suggests differs in some measure. He holds that the cost of a veterinary education is not only out of proportion to the rewards of the veterinarian, as Doctor Reynolds has said, but that the education given is not in line with what agriculture wants. Major Van Allstyne holds that the greater bulk of veterinary practice does not require the degree of skill required

[36] The Supply of Veterinary Students and of Veterinarians in the Near Future, by M. H. Reynolds, University of Minnesota. Veterinary Medicine, Vol. 22, No. 4, April, 1927.

[37] The Farmers' Viewpoint of Veterinary Service, by Major W. C. Van Allstyne, U. S. A. (Retired). Veterinary Medicine, Vol. 22, No. 9, September, 1927.

of veterinary graduates of present day, and cannot afford to pay for that degree of skill. That in the main, what is wanted is a degree of veterinary skill comparable to much of that supplied twenty years ago, and which, because of the low cost of a veterinary course at that time, could be supplied at a lower cost than the present veterinary graduate can afford to work.

G. W. Browning[38] agrees with Major Van Allstyne both as to the cause and remedy for the present shortage of veterinary students, but he regards the competition of state veterinary service in the guise of federal veterinarians, county veterinarians and particularly county agents as being the reason why farmers expect cheap or free veterinary service.

S. L. Stewart[39] draws the conclusion, from his experience with farmers, that they do not want cheap veterinary service if it is to be poor in quality as well as low in price. He believes that the opportunities for highly qualified veterinarians at present far exceeds those for mediocre veterinarians, and that the good veterinarian can command a return quite satisfactory even upon his large investment in training. He regards the present shortage of veterinary students as being due largely to the inadequate salaries paid by the Federal bureau of animal industry and by states and municipalities for veterinary work.

P. C. Guyselman's[40] view of the matter coincides with Doctor Stewart's. He finds the rewards of good veterinary service in California justifies the present high cost of a veterinary education, and regards the large number of graduate veterinarians in that state engaged in other lines of work than veterinary practice as being in part due to misfits. He regards any move to lessen the present high cost of a veterinary education, by lowering the standard, as a step backward as unnecessary as it is inadvisable.

[38] Prefers the Quack Veterinarian to the Farm Agent, by G. W. Browning. Veterinary Medicine, Vol. 22, No. 11, November, 1927.

[39] Synonyms: Cheap Veterinary Service and Poor Veterinary Service, by S. L. Stewart. VETERINARY MEDICINE, Vol. 22, No. 11, November, 1927.

[40] Should Veterinary Education Retrace Its Steps, by P. C. Guyselman. VETERINARY MEDICINE, Vol. 22, No. 12, December, 1927.

Fright Disease

This little-understood subject has continued to occupy considerable attention though it has received less discussion than in the years immediately preceding the current one. A good deal has been written on the subject, but not much information has been added to the little we already possessed. Probably there has been less confusion than heretofore of this disease, with convulsions incident to distemper, parasitism and dietary errors. Or with the mania sometimes occasioned by occluded anal pouches or some other extremely painful condition, such as foreign bodies in the mouth, the esophagus or the intestines.

There has been an unsuccessful attempt at a nomenclature more in keeping with the occurrences, cause and course of the disease than fright disease. Epizootic, enzootic and infectious hysteria have been suggested, but the disease is frequently neither epizootic nor enzootic, nor is there sufficient reason to consider it infectious. While the use of the term hysteria for a disease the attacks of which have no relation to sex, can scarcely be justified.

Running fits and, to a less extent furious fits, continue to be popular terms for the ailment, but are not more descriptive than the original name, fright disease, which should probably be retained until one more descriptive or more directly related to the cause can be found.

In a discussion at the Iowa meeting[41] in January, the following was given on this subject:

Running fits, fright disease or furious fits, is in the main the result of abysmal ignorance in feeding the dog and woeful mishandling. No part of the country has a monopoly on this condition, nor is it a new disease, nor any one particular ailment. It is due to a variety of causes, faulty diet, internal parasites, constipation, obstruction of the pyloric orifice, indigestible material in stomach or intestines, duodenal impaction and rarely, estrum and occlusion of the anal pouches. Any of the foregoing may be either a direct or contributing cause. Some excite-

[41] Notes on Small Animal Practice, gathered at recent veterinary meetings, by D. M. Campbell. VETERINARY MEDICINE, Vol. 22, No. 3, March, 1927.

ment is usually involved in precipitating the fit.

In the mild type of fits, the animal may merely run and hide in some dark place for two or three hours. In more pronounced cases, the dog may exhibit great fear and possibly bark wildly and at times bite anyone who approaches. In the running type, the dog will run until it falls from exhaustion, sometimes until it falls dead. It is differentiated from rabies by its sudden onset; from the nervous form of distemper, by the history and from other conditions, by its violence, history, exclusion, etc.

The treatment consists in removing the cause and in most cases in that alone. Gastro-intestinal lavage is of first importance in removing irritating matter from the alimentary canal.

In such cases, gastro-intestinal lavage will sometimes remove a surprising array of objects—hard cooked liver, bottle caps, wax paper cups, oil cloth, coal, bones, nails, tacks and almost everything else that a dog can get hold of and swallow.

If gastro-intestinal lavage is not practical for any reason, arecolin hydrobromid one-eighth grain to one and one-half grains depending upon the size of the dog, may be given. Apomorphin likewise, is useful in 1/40 to 1/5 grain doses hypodermically.

Where the ailment is due to dietary deficiency, it will require time to relieve it. Feed the animals raw meat, raw milk, raw eggs, tallow, bones and non-starchy vegetables, and give a dram of cod liver oil three times daily and one to ten grains of calcium lactate at the same intervals.

For the lavage, use normal salt solution or soap emulsion. It is easier, of course, to give the lavage after the animal has quieted down, but sometimes it is necessary to treat it during the convulsion.

C. H. Covault[42] in a discussion at the meeting of the Eastern Iowa association, offered the following as a result of his observations:

The disease has some appearance of being infectious. When it appears in a district, numerous cases are apt to occur for a year or two, and where a number of dogs are kept together, it is not uncommon when an attack appears in one dog for others to develop it. Despite considerable investigation, no organism has been isolated that could account for the disease, nor can it be communicated with any certainty by association. The injection of body fluids and excreta is uniformly negative.

Most practitioners agree as to the symptoms of fright disease, but there is a wide variance in their opinions as to the cause.

The ailment seems to have its origin in the mucous membrane or the skin and to be due to an irritation in these organs. Gastro-enteritis and particularly enteritis is a very common lesion in animals dying of fright disease.

Diet seems to be a minor factor, but kennel men quite commonly regard it as the chief cause. Parasites are looked upon by many as being the most important cause, and yet many cases have been observed in animals that harbored no parasites, or but few. One case was observed in a dog that had an extraordinary heavy infestation of fleas. The fleas were removed and no further attacks occurred. Some cases affected by hook worms were relieved by the elimination of the worms. Others were not helped. Some cases affected with tapeworms were relieved when the tapeworms were removed. Others were in no way improved by such treatment. Cases that occurred in dogs fed on commercially prepared feeds, disappeared when the feed was changed.

Some incriminate teething as an important cause; others believing canine distemper is all important. The mortality is not high.

Bismuth subnitrate has proved useful in allaying intestinal irritation. Anodines may be used for their temporary effect, but are not curative.

Careful observers are of the opinion that fright disease is a clinical manifestation due to many causes.

[42] C. H. Covault discussion at the 14th annual meeting of the Eastern Iowa Veterinary Association, Cedar Rapids, Iowa, October 6, 1927.

Canine Distemper

The clinicians have offered us nothing new on this disease during the year, though the laboratories have offered us some accession to the antigen-serum means for the prevention of the disease.

A great deal is being expected from the researches being carried on by means of the Field Distemper Fund in England. Other research workers are apparently awaiting the outcome of that largely endowed, superbly equipped and splendidly arranged project.

An interesting contribution to the literature on the subject is a short description by Dr. J. G. Horning[43] of his visit to the Field Distemper Fund Research Laboratory at Mill Hill near London, England. In the research conducted there they have found it necessary to breed their own stock and after the first generation, all the original animals were withdrawn from the laboratories so that they are now able to produce any quantity of puppies required that are known positively never to have been exposed to distemper and the following has already been established by this research.

1. Some of the difficulties inherent in experimental study of such a highly infectious disease as dog distemper may be avoided by the use of the ferret as the experimental animal.

2. Elaborate precautions are necessary to limit infection to the experimental animal.

3. Six different strains of dog distemper caused a single type of disease in the ferret, which ran a uniform course; and the strains cross-immunized against each other.

4. The disorder may be passed from ferret to dog or from dog to ferret at will.

5. The indications are that dog distemper is a single entity, and that the response of the ferret to infection is comparable in all essentials with that of the dog.

6. Dog distemper is an acute infectious fever comparable in many respects with measles or influenza in man; a disease which, alone will induce a severe fever and serious bodily disturbances, but is rarely fatal; a disease which is very liable to light up a latent infection, or to open wide the door to secondary infections of various kinds.

[43] A Veterinarian's Observations in Europe, by J. G. Horning. VETERINARY MEDICINE, Volume 22, No. 5, May, 1927.

Incubation Period in Distemper

Ashe Lockhart,[44] in an interesting communication, says:

There is perhaps no phase of canine distemper more generally misunderstood than its incubation period. Various texts place this at from two to fourteen days.

In working with distemper, the writer and his associates have observed that the period of incubation and the mode of onset are relatively constant. The report is based upon research work in which 34 dogs varying in age from four months to ten months and none of which had ever had an attack of distemper, were exposed to animals in any stage of the disease.

Of the 34 animals exposed, 31 developed typical cases of distemper, two showed some symptoms of the disease and one remained healthy throughout the test. As a result of these observations it was shown that in a general way it may be said that the complete incubation period of distemper varies from 9 to 18 days, but that in those animals which are entirely healthy at the time of exposure the usual complete incubation period is from 13 to 15 days.

An interesting observation was that all of the 31 cases that developed typical distemper showed a preliminary rise of temperature, three in four days after exposure, five in five days, four in six days, nine in seven days, seven in eight days, two in nine days and one in ten days. Thus 16 or more than half of the animals showed this preliminary rise in temperature on the seventh or eighth day after exposure.

The rise in temperature persisted for twenty-four to forty-eight hours and then

[44] Incubation Period of Dog Distemper, by Ashe Lockhart. VETERINARY MEDICINE, Vol. 22, No. 2, February, 1927.

subsided to normal for a period of 96 to 120 hours, when it rose again. Prior to this second rise of temperature, there were no symptoms of the disease that would ordinarily be noted. With the second rise in temperature, other evidences of the disease appeared, coughing, sneezing, nasal and ocular discharge. These symptoms of the disease did not appear, as the text books say, in two to fourteen days after exposure, but occurred on the ninth to the eighteenth day. The symptoms appearing on the 9th, 10th, 11th, and 12th day were in animals having a heavy parasitic infestation. The animals in which the symptoms appeared on the 14th to the 18th day were free from parasites and healthy.

There were other evidences that parasitism lowered the resistance to distemper.

Rinderpest Vaccine Investigations

R. A. Kelser,[41] who had been loaned by the Veterinary Corps of the Army to the Insular Bureau of Agriculture, Philippine Islands, announced early in the year a great improvement in the preparation of vaccine for the prevention of rinderpest. The shortcomings of the vaccine previously used was the long time required to produce it, approximately six weeks, its poor keeping qualities and high cost.

All of these faults have been overcome in the vaccine prepared by Major Kelser. The importance, in countries in which rinderpest is indigenous of a rinderpest immunizing agent that can be had in adequate amount and at a reasonable expense is readily apparent on reading the veterinary literature of such countries. The following from C. Dandayutha Pani,[42] on a recent outbreak of rinderpest in India is illustrative of the difficulty of the control of this disease under the old method.

In Mysore State rinderpest epidemic for the last one year has done great havoc to the country. Hundreds of villages were affected and the loss due to this scourge was enormous. Like other parts of this country, the veterinary authorities tried to control the spread of the disease by passive immunization of the healthy. After some time in spite of great endeavors it was observed that serum alone method of inoculation became unpopular due to the inoculated animals contracting the disease after the period of immunity (which is only 9 days) had passed off. In most of the villages the veterinary assistants found great difficulty to make the cattle owners understand that the immunity conferred by passive immunization lasts only nine days and to induce them to allow their cattle to be reinoculated. In some villages even after inoculation and reinoculation was carried out among all the healthy cattle the disease still persisted for a long time, due to the inoculated animals succumbing to the disease after the period of immunity has passed off by getting infection from the surrounding villages. Thus, naturally, the people lost all confidence in this kind of inoculation and it was therefore thought to be a waste of public money to pursue this method any longer. Under these circumstances the veterinary authorities were forced to discontinue this method of inoculation and to resort to the method of active immunization with all its risks and at an enormous expense.

The *Manila Bulletin* states that the contribution of Major Kelser to the preparation of rinderpest vaccine is worth more to the Philippines than the total cost of the American occupation of the Islands since Dewey sailed past Point Cavite. Thus has an officer in the veterinary corps of the Army rendered a single service worth more to the Nation than the whole veterinary corps will cost in the next 1,000 years of peace.

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[41] Rinderpest Vaccine Investigation, by Major R. A. Kelser, U. S. A., Veterinary Bulletin, for the Veterinary Corps, Medical Department, U. S. Army, Vol. 19, No. 3, March, 1927.

[42] Some Experiences on Serum-Simultaneous Method of Inoculation for Rinderpest in the Field, by C. Dandayutha Pani, Veterinary Assistant Surgeon on touring duty. The Indian Veterinary Journal (India), Vol. 3, No. 3, January, 1927.

Sterility in Cattle

W. L. Williams[47] in a splendid article on this subject, offers a maximum of sound information for practicing veterinarians. Perhaps little in the article is new since Prof. Williams has taught these matters in his very extensive writings on breeding problems at least since 1915.

The professor again emphasizes as he has so often done before that there is no sharp demarcation between sterility and abortion as these terms are ordinarily used. Sterility as usually applied, refers to those cases in which the ovary is not fertilized and to abortions occurring immediately after conception and through each stage of gestation down until the time that the fetus becomes large enough to attract attention by the act of abortion.

The following quotations indicate his stand. All are abundantly substantiated by the personal observations of this noted investigator of diseases incident to breeding and by the work of other authorities in this field.

In the male, female and intra-uterine young alike, the most important element, towering far above all others combined, is infection.

The infection is transmissible from male to female and vice versa by coitus and otherwise; and once lodged within the uterine cavity, to the intra-uterine young.

The tubo-uterine cavity of the female constitutes the chief laboratory in the reproductive system where infection has its maximum opportunity for development.

The variations in the effects of tubo-uterine disease are illimitable and inextricably entwined with each other.

Tradition has handed down abortion, sterility, retained placenta, dystocia, uterine prolapse and many other associated conditions as distinct maladies. The description and definition of each as a separate disease furnishes all sorts of difficulties.

It appears quite certain that in cows, approximately one-half of the fertilized ova perish without conception having been recognizable, and that accordingly the early death of the fertilized ovum comprises a majority of the cases of sterility in cattle. It is known positively that the fertilized ova in the sow number approximately three times the number of pigs farrowed.

. It has been said that there are 24,000,000 milk cows in the United States and the U. S. Department of Agriculture estimates that among these contagious abortion causes an annual loss of $20,000,000 to $30,000,000, a loss of about one dollar per cow.

So far as I have been able to determine, the average cow lives less than seven years and produces less than five viable calves. If the standard were fixed at one healthy calf each fourteen months, the cow should have ten healthy calves to her credit at thirteen years and four months of age. If this standard be accepted, the average loss becomes 50 per cent of the ideal value of each cow. Any standard which might be adopted would show tremendous losses. If contagious abortion costs the United States no more than $20,000,000 to $30,000,000 annually it is a very little consequence in comparison with sterility.

Prof. Williams holds that the calf reared for breeding purposes should be nurtured in a healthy uterus and born physiologically healthy, as shown by the following.

There is ample evidence to show that some genital infections acquired *in utero* prove permanent and constitute serious obstacles to breeding.

It is highly unfortunate that the veterinary profession and the breeder have not as a rule assigned greater importance to the preservation of the health of the young calf as a valuable asset to its later breeding efficiency.

Prof. Williams lays more stress on dis-

[47] Sterility in Cattle, by W. L. Williams, Emeritus Professor of Obstetrics and Research in the Diseases of Breeding Animals, New York State Veterinary College, Cornell University. North American Veterinarian, Vol. 8, No. 9, September, 1927.

eases of the male than most other investigators.

In 1921 I incorporated within my treatise upon genital diseases[48] as the most vital principle in successful reproduction, the mating of only sexually healthy individuals.

In 1923, I presented data which I regard as conclusive proof of the danger to the female and to the intra-uterine young from a diseased male.

It has been quite clearly shown that an examination of the fetal membranes accurately reveals the state of the health of the uterus of the cow, indicates the location, character and extent of uterine lesions, foretells with accuracy the outlook for further reproduction and suggests the most desirable method of handling.

Prof. Williams holds that the lactation of the dairy cow should be considered a part of the reproductive burden, just as surely as is the period of gestation, and inferentially regards the dairy cow as the most prone of all domestic animals to breeding diseases because of the abnormal strain of the highly developed function of milk production. He warns against sexual overload, against periods of gestation during the height of milk production, against frequently recurring periods of gestation and against breeding heifers at a very early age.

As a rule the American breeder overloads his herd sire, and, worst of all, the more highly he prizes the sire, the worse he overloads him.

Most scrub bulls are proverbially fertile, and it is highly probable that one of the chief reasons therefore is that ordinarily they are used in small herds and carry a very light sexual load.

McIntosh records a case in which a cow aborted ten fetuses in about twenty months; triplets twice and twins twice. It was an enormous overload which the normally uniparous cow could not carry.

It may be seriously questioned whether dairymen do not largely overload heifers sexually when they breed them to calve at two years of age. Abortion is usually two to four times as prevalent in dairy heifers in first, as compared with later pregnancies, and the underlying endometritis becomes so aggravated that sterility is very common.

My impression is that the sheep is the most highly fertile domestic animal. The ewe is pregnant five months, nurses her young moderately for three or four months, and then has a complete sexual rest, without pregnancy or lactation for three or four months. The ram has a sexual rest of ten or eleven months.

An aged cow can not carry the same sexual load as one in her prime. Similarly a uterus which has become prematurely senile cannot bear the same load as a healthy and undamaged one.

Investigations have amply shown that the uterus is normally or perhaps it were better to say ordinarily the habitat of a large number and a considerable variety of bacteria that are non-pathogenic only because of the resistance of the uterus, and that faults of food, water, exercise and housing, by just the degree in which they lower the vital resistance of the animal to the ever-present horde of potentially pathogenic organisms in the uterus do they render the cow susceptible to the disasters of sterility and abortion.

Rations deficient in essential mineral salts or in certain vitamins quickly prove disastrous to reproduction. Evans recorded conclusive evidence that by feeding female rats upon vitamin-deficient rations, sterility could be produced regularly, and this could in turn be overcome largely by adding the required vitamins. More recently Meigs has shown apparently conclusively that by feeding cows upon a calcium-deficient ration he could promptly produce abortion and sterility.

Some veterinarians have claimed all along that the most dangerous exposure of breeding cattle to pathogenic bacteria has been the widespread resort to inoculation with living abortion bacilli.

Prof. Williams has all along been strongly opposed to the injection of living abortion bacilli as a preventative of

[48] W. L. Williams' "The Diseases of the Genital Organs of Domestic Animals."

infectious abortion. He reiterates this stand and notes with satisfaction that the proponents of this method have changed their attitude or, as he puts it, "The use of live Bang bacilli as a valuable measure appears to have quite suddenly become discredited in the house of its friends."

The prevention of sterility in cattle is an objective within reasonable reach of veterinarian and breeder; the cure of sterility is largely a delusion. It is no laggard's problem; it calls for prolonged, intelligent study, constant watchfulness, skill and sincerity.

Poultry Diseases

Probably because of its newness and the rapidly increasing importance of poultry practice, the discussion of poultry diseases has commanded attention during the year in veterinary publications out of proportion to its present magnitude. It is a subject that is relatively new to most practitioners and on which they are anxious for additional information.

For the practitioner, by all odds the most valuable contribution from a single writer to a discussion of the matter is that of F. D. Patterson,[49, 50, 51, 52, 53, 54] The series of articles by Doctor Patterson will extend well into 1928, and they cannot be reviewed as a whole at this time.

Importance of Poultry Practice to Veterinarians

J. M. Hendrickson[55] points out in a very forceful way many reasons why veterinarians should interest themselves in poultry practice, and cites conditions on Long Island, New York, which is ordinarily thought of as part of New York City, to substantiate his arguments.

Like most other writers, he stresses the recent growth of the industry.

Not many years ago, the poultry industry was largely confined to small, backyard flocks scattered here and there on the various farms. This, of course, did not necessitate the attention of a large group of professional men to care for the occasional ailments in the flocks, and it is not surprising that little attention was given this phase of veterinary medicine. Today, however, the situation has been greatly changed. The poultry industry has been growing steadily and very rapidly. The small backyard flock of a few birds has developed into a flock of several hundreds or thousands, and the person who formerly disregarded this source of income entirely is today making his entire livelihood with his poultry and poultry products. The total economic value of the poultry industry now exceeds that of the majority of our so-called major industries.

For example on Long Island in 1920 there were 25 poultry farms averaging 2,000 birds each, but in 1927 the industry on Long Island has increased to 250 farms with an average of 1,000 birds each, several of the farms possessing more than 10,000 layers each, one of them utilizing 150 acres of land.

The yearly value of the chicken industry on Long Island may be conservatively estimated at $3,000,000 and the duck industry at $5,000,000. There are 100 duck ranches in the district. The largest of these market 100,000 ducks during a season.

When Doctor Hendrickson went to the state poultry laboratory on Long Island, he sent a questionnaire to 200 poultrymen to ascertain how much they were depending upon veterinary service to protect the health of their flocks. The answer was appalling. Apparently only one veter-

[49] Selection and Housing of Breeding Stock, by F. D. Patterson, Jr., Department of Veterinary Medicine, Alabama Polytechnic Institute. VETERINARY MEDICINE, Vol. 22, No. 6, June, 1927.

[50] Feeding Poultry in the Breeding Pen to Produce Strong Disease Resistant Chicks, by F. D. Patterson, Jr., Department of Veterinary Medicine, Alabama Polytechnic Institute, VETERINARY MEDICINE, Vol. 22, No. 8, August, 1927.

[51] The Egg and Its Relation to Healthy Chick Production, by F. D. Patterson, Jr., Department of Veterinary Medicine, Alabama Polytechnic Institute. VETERINARY MEDICINE, Vol. 22, No. 9, September, 1927.

[52] Diseases of the Reproductive Organs of the Hen, by F. D. Patterson, Jr., Department of Veterinary Medicine, Alabama Polytechnic Institute. VETERINARY MEDICINE, Vol. 22, No. 10, October, 1927.

[53] Non-Specific Intestinal Disorders of Chicks, by F. D. Patterson, Jr., Department of Veterinary Medicine, Alabama Polytechnic Institute. VETERINARY MEDICINE, Vol. 22, No. 11, November, 1927.

[54] Nutritional Bumblefoot, by F. D. Patterson, Jr., Department of Veterinary Medicine, Alabama Polytechnic Institute. VETERINARY MEDICINE, Vol. 22, No. 12, December, 1927

[55] Why Veterinarians Should Be Interested in Poultry Disease Control, by J. M. Hendrickson, Department of Pathology and Bacteriology, New York State Veterinary College at Cornell University. The Cornell Veterinarian, Vol. 17, No. 3, July, 1927.

inarian was giving any attention to poultry practice and he was serving only three farms. All of the poultrymen said they could make use of veterinary services.

To meet the need for veterinary service among the poultrymen of Long Island, Doctor Hendrickson organized a poultry practice school which most Long Island veterinarians attended. Testing for white diarrhea was stressed as offering as an opportunity for immediate employment to the veterinarian, and the chance for them to get acquainted and to get started in poultry practice. It was found that a veterinarian could supply himself with good serviceable equipment for this work at a cost of about $125.00. This included a home made, but satisfactory and serviceable incubator. Doctor Hendrickson regards the practicing veterinarian as the proper one upon whom to rely for white diarrhea testing, but thinks that some sort of state supervision to give a standing and uniformity to the work should be provided for.

Other work on Long Island that he finds needing veterinarians is vaccination for the prevention of pox, cholera and typhoid. The testing of fowls for tuberculosis. While he does not regard the tuberculin test as a practical means for handling the disease in poultry, he does regard it as having a place in locating infected flocks rather than individuals.

Then he finds all manner of veterinary service required in the matter of hygiene and sanitation, disinfection, postmortem examinations, the detection of ailments due to feeding and infection, etc.

The fees that may be had in poultry practice he finds, as in other practices, are commensurate with the service rendered. Each bird in an average flock is worth $3.00 to $4.00. An average flock on Long Island is worth as much as 30 to 40 high grade dairy cows and certainly no one would regard dairymen with 30 good cows as having an insufficient investment to justify the employment of a veterinarian to protect their health and enhance their productivity. Further, he finds poultry practice can be largely handled from the office and that a very considerable amount of poultry practice may interfere very little or not at all with a veterinarian's general practice, and at the same time, add very materially to his annual income.

O. W. Johnson,[56] like Doctor Hendrickson stresses the need of poultrymen for good veterinary service. He became interested himself in poultry raising as a side line, and soon found himself gradually let in to a fair poultry practice, which he was the better prepared to handle because of his experience in poultry culture. Doctor Johnson emphasizes the point that in the long run the infectious diseases are not the most destructive or the most costly to the poultryman. It is bad sanitation, bad hygiene, faulty feeding and housing, impure water and neglect that take the big toll from the profits of the poultry industry.

Doctor Johnson believes that other things being equal, the veterinarian who has had a practical experience in poultry raising will be better equipped to handle such matters than one who has not had such experience.

G. H. Mydland[57] does not find poultry practice in his section paying as well as other types of practice, but nevertheless it is well worth while and, in the main, is just so much additional income to the veterinarian. Further than this, he has found his poultry practice an excellent means of becoming acquainted in his locality and it has brought him no small amount of additional practice among other domestic animals.

He believes that veterinarians can well afford to interest themselves in caponizing and poultry culling, not so much because of the fees that they can obtain for this work, which are low, but because of the acquaintance, good will and prestige that it brings.

[56] Poultry Raising and Poultry Practice a Valuable Adjunct to a General Veterinary Practice, by O. W. Johnson. VETERINARY MEDICINE, Vol. 22, No. 2, February, 1927.

[57] Poultry Practice, by G. H. Mydland. VETERINARY MEDICINE, Vol. 22, No. 5, May, 1927.

E. D. Criswell[58] relates his experience in building a poultry practice from nothing to one producing an income of $100.00 or more monthly in a single year with little interference to his regular practice. He did this by advertising that he was prepared to handle the farmers' and the farmers' wives' poultry problems and that he would autopsy any chicken brought to his office without expense, and that when on farms and in making calls on other matters, he would perform a like service without charge. He found this offer to hold autopsies without charge instrumental in bringing his services to the attention of the poultry industry of his locality very rapidly. It was a service that the poultry raisers appreciated very highly and availed themselves of to a surprising extent.

Bacillary White Diarrhea

The disease of poultry that has received the greatest amount of attention from research workers, state sanitary and regulatory officials and practitioners, is white diarrhea. There is not quite a unanimity of opinion in this matter. B. A. Beach[59] on the one hand, is doubtful if the presence of birds affected by white diarrhea as shown by the agglutination test is inimicable to the successful handling of a poultry flock. He finds the growth of reactors and production in eggs and the fertility and hatchability of the eggs and the viability of the chicks hatched from the eggs of reactors not materially differing from that of non-reacting birds.

B. F. Kaupp,[60] on the other hand, in a fifty-page bulletin on the subject of bacillary white diarrhea, which deals with all phases of the problem, announces the following conclusions:

1. Bacillary white diarrhea probably is present wherever poultry husbandry is practiced. The infection has been found in 71 of the 100 counties of North Carolina. The disease is highly contagious and is productive of great monetary loss to the poultrymen of the state.

2. The disease produces a septicemic condition in chicks. The lesions produced are fairly constant, and are typical of the disease.

3. The disease may assume a virulent form in adults. The clinical history of infected adults shows slight deviations in respiration, elevation in temperature, a leukocytosis in the blood, and is not usually fatal.

4. Carrier birds may be profitable from an egg production standpoint during the pullet year.

5. Mortality from pullorum infection commences in the shell. Forty-eight of 175 chicks, or 27.4 per cent of total number of chicks dead in the shell on 21st day of incubation of eggs from carrier birds revealed infection with *B. pullorum.* In comparison with this figure, only 4 or .004 per cent of 1,000 chicks dead in the shell on the 21st day of incubation in hatcheries using only eggs from blood-tested stock, showed the presence of this organism.

6. In flocks of reactors studied, the agglutination test would remove 90 per cent of the carriers if applied at any time in one flock of 29 reacting birds held 14 months; it would have removed 98 per cent of the carriers in an infected flock of 21 birds studied for 6 months, if applied at any time, and would have removed 98 per cent of the carriers of avian typhoid in a flock of 50 birds studied 6 months, if applied at any time during that period.

7. The intermittent results obtained on application of the agglutination test to carrier birds in some instances is established. These investigations bring out the fact that the intermittent reactor delivers infected eggs during continuous months of negative reactions, and probably never recovers from the disease.

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[58] My Methods in Poultry Practice, by E. D. Criswell. VETERINARY MEDICINE, Vol. 22, No. 10, October, 1927.

[59] Results of White Diarrhea Investigation, by R. A. Beach, J. G. Halpin and C. E. Lampman, Wisconsin Agricultural Experiment Station. Journal of the American Veterinary Medical Association, Vol. 23, No. 5, February, 1927.

[60] Bacillary White Diarrhea, by B. F. Kaupp and R. S. Dearstyne, The Agricultural Experiment Station of the North Carolina State College of Agriculture and Engineering. Technical Bulletin No. 29, June, 1927.

Fowl Typhoid and Fowl Cholera

B. F. Kaupp,[61] in an elaborate bulletin of nearly 100 pages, devoted to these subjects, announces the following conclusions:

Fowl typhoid:

1. Avian typhoid is a particularly virulent contagion attacking principally the domestic fowl. The causative agent is of bacterial origin — *Eberthella sanguinaria* (Moore).

2. The disease is probably prevalent in all countries where poultry husbandry is practiced. It is widely distributed in North Carolina, where it occurs during the late fall, winter and early spring.

3. The disease in the field usually has a mortality rate of about 30 per cent, although instances have been recorded in which the mortality was 100 per cent. It has a progressive spread from flock to flock. Within the flock, unless checked, the disease spreads until all susceptible birds are affected.

4. The means of dissemination from flock to flock is through infected soil on common range grounds; through surface washing, and through conveyors of the disease, such as man and animals. In the flock, the disease is spread through infected soil, infected food material and infected drinking water, and through eating the blood of birds dying of the disease. There is slight possibility of spread of the disease through actual contact.

5. The carrier of avian typhoid is a flock menace. Sparrows and pigeons are means of conveying the disease.

6. The disease has pronounced clinical symptoms, chief of which is the elevation of temperature, ænemic condition of the face, comb and wattles, and a sulphur colored discharge. The dead birds show characteristic anatomical changes, these being pronounced in the liver, spleen, kidneys and intestines. There is alteration in the blood composition, with a pronounced increase in the number of leucocytes, and decrease in erythrocytes. The hemoglobin is reduced.

7. Typhoid may be controlled through sanitation, isolation or destruction of suspects, safe disposition of the carcasses of birds dying of the disease, disinfection of drinking water, and the prophylactic vaccination of well birds. Vaccination produces an immunity of unknown duration, but the single inoculation should immunize the bird for the period of duration of the disease in the flock.

Fowl Cholera:

1. Avian cholera, caused by *Pasteurella avicida,* is prevalent in most countries where poultry is kept.

2. The dissemination of this disease in the flock and from flock to flock is probably accomplished through the same agencies as in the case of avian typhoid.

3. There are morphological differences and differences in physiological reactions of the causative organisms of these specific diseases that differentiates them as separate and distinct germs.

4. The clinical symptoms, blood changes, and pathological anatomy of these diseases, though having much in common, are sufficiently different to establish a basis for differential diagnosis.

5. Control measures that apply to avian typhoid should be effective in checking the spread of avian cholera.

Parasites of Poultry

A. S. Schlingman[62] reports an investigation of the efficiency of kamala and tetrachlorethylene against parasites in a small number of fowl.

He found one-gram doses of kamala 100 per cent efficient against tapeworms and not harmful in birds weighing from one to six and one-half pounds.

Tetrachlorethylene was equally efficient against round worms in 1 cc. doses for birds weighing two and one-half pounds.

The foregoing results were obtained where these anthelmintics were administered separately with a three-day interval. Where both anthelmintics were given at one time, the efficiency of both was lowered. Neither anthelmintic had any effect on cecal worms.

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[61] Fowl Typhoid and Fowl Cholera, by B. F. Kaupp and R. S. Dearstyne, The Agricultural Experiment Station of the North Carolina State College of Agriculture and Engineering. Technical Bulletin No. 27.

[62] Anthelmintic Efficiency of Kamala and Tetrachlorethylene in the Treatment of Chickens, by A. S. Schlingman, Medical Research Laboratories, Parke, Davis & Company. Journal of the American Veterinary Medical Association, Vol. 23, No. 4, January, 1927.

Swine Diseases

As might have been expected from the unusual prevalence of hog cholera in the early summer of 1926 evolving into a widespread outbreak of this disease in the fall of the same year, with an extraordinary amount of loss following vaccination, the subject of swine diseases, and particularly post-vaccination troubles came in for a tremendous amount of discussion during the early months of 1927.

A few took the stand that a great amount of vaccination that veterinarians were called upon to do during the outbreak, and the consequent urgency of the demand and the celerity with which the work had to be accomplished, resulted in some veterinarians giving less attention to the condition of the animals at the time of vaccination and to their care following vaccination than is required for good work. Others held that the demand for virus was so urgent that the serum producers did not in all cases select their virus pigs with the requisite care for the production of a good product, and still others held that a number of serum producers availed themselves of the opportunity afforded by the great demand for serum to unload large quantities of old and more or less impotent serum.

Officials and practitioners alike agreed that the widespread lay vaccination that had grown up during the years when hog cholera was to a large extent quiescent resulted in much unnecessary loss.

But when the reports from the field came in, when the practitioners were enabled to tell their side, at the various state veterinary meetings held during the winter, the evidence appeared to show that the part played by weak virus and impotent serum and by poor vaccination was responsible for "breaks" in far less degree than were other conditions that had been overlooked by the live stock sanitary officials in their attempts to fix the blame. Throughout 1926 and during 1927 there has been an unheard of prevalence of infectious enteritis in swine in the corn belt. The infectious enteritis is a potent factor, undoubtedly the most potent factor, when present in a herd, in causing a loss following proper vaccination. Further, the weather conditions in the fall of 1926 appeared particularly favorable to "flu" in swine, another cause for poor results following proper vaccination.

T. P. White[63] estimated the loss from cholera in the states involved in 1926 outbreak at not more than 60 per thousand. Years have been known in which a loss was sustained from as high as 130 hogs per thousand.

On the widely heralded charge of profiteering on the part of serum companies, Doctor White said: "In justice to these agencies, it must be stated that with very few exceptions, they played fair. However, information is on record where figures of 44c per 100 cc. were quoted in June and $2.75 for the same volume of serum in October."

Post-Vaccination Complications

R. R. Birch,[64] in discussing this subject, takes the stand that losses following vaccination in 1926 were unnecessarily high.

Much post-vaccination trouble is really pre-vaccination trouble. "Coming events cast their shadows on before," but if the shadows are unseen, the events find us puzzled and unprepared. For the most part, causes which determine serum failures have been in operation sometime before the date of vaccination, and their presence could have been detected in advance by experienced men. In most exceptional instances, the approach of danger cannot be foretold and occasional disasters are, therefore, an integral part of any extensive vaccination program. They are not, as some regard them, a thing apart, and frank recognition of this fact is a step in the right direction.

Potency in the serum used, and experience on the part of the veterinarian who examined the herd and uses it are tremendous factors in minimizing losses, but they will not prevent them altogether. If this truth could be universally accepted by veterinarians, serum-producers and swine-breed-

[63] Report of the Hog Cholera Situation, Covering a period from July 1, 1926, with Remarks as to Causes and Practices Involved, by T. P. White, Bureau of Animal Industry. 30th Annual Report, United States Live Stock Sanitary Association.

[64] Post-Vaccination Complications, by R. R. Birch, New York State Veterinary College, at Cornell University. 30th Annual Report, United States Live Stock Sanitary Association.

ers, there would be a gain in mutual confidence. The veterinarian would not be embarrassed by calls for explanations which do not explain, the serum-producer would not be tempted to make claims which sometimes fail to materialize, and the breeder, recognizing the element of danger in all serum-virus vaccination, would handle his herd so as to minimize this danger.

Training and experience on the part of the man who uses the simultaneous treatments are essential, but these qualities must be supplemented by habitual carefulness, both in making herd examinations, and in vaccination technic, or they become, in effect, partially or wholly nullified.

The qualified veterinarian who accepts responsibility in handling hog cholera does more than use a hypodermic syringe. He handles a situation. The element of judgment is essential, and this, in turn, rests on training and experience. A novice is born every minute, but training and experience are products of a slow, exacting and painful process.

Doctor Birch classes post-vaccination trouble into the so-called serum "breaks" which occur within the first four weeks following vaccination and virus "breaks" which occur after the first four weeks following vaccination.

The administration of serum and virus at a time when any devitalizing influence is brought to bear during the reaction period, always invites unnecessary disaster. In such cases inexperience cries: "Impotent serum," but experience seeks other causes.

Doctor Birch classifies among the common causes of serum "breaks"; heavy parasitic infestation, necrotic enteritis, necrotic stomatitis, hog "flu," advanced pregnancy, shipping, weaning, exposure to inclement weather, poor nutrition, injudicious feeding, rough handling and hog cholera in the incubation period at the time of vaccination.

He states further: We believe there is good evidence that a two-year date limit on serum is responsible for some serum "breaks," and we have been led to wonder whether some of the remote distributing points are carefully checked regarding the manner in which they store their products and in the matter of outdated serum and virus.

In the virus supplied, Doctor Birch has not so much confidence as he has in the average serum. He regards the use of virus within ten days of its production as being ideal, if not essential to uniformly good results. He states: We know, of course, that 60 day virus is usually virulent, but each day that passes adds its quota, however remote, to the danger associated with its use. All in all, the fresher it can be used, the better.

Vaccination Breaks and Their Prevention

J. W. Benner,[68] in a paper read at the Minnesota and Iowa state veterinary associations in January, took the view that post-vaccination losses during the recent outbreak of hog cholera were inexcusably large, saying:

Too many vaccination "breaks" occur at all times, but during the past year they have occurred by the thousands. The loss on hogs by unthriftiness and death has been enormous. The confidence of farmers and, in some cases, practicing veterinarians has been badly shaken. The influence which hog cholera vaccination "breaks" have upon a countryside are tremendously important. It takes years of the most successful vaccination to overcome the skepticism caused by one vaccination break in a neighborhood.

The farmer must choose whether he will pay the high cost of vaccination and perhaps have cholera artificially introduced into his herd by a vaccination break, or save the large vaccination bill and risk natural infection.

The 1926 wave of cholera among our susceptible hogs, which newspapers have written much about, was accompanied and greatly enlarged by another wave about which less has been said. This brings me to a chain of events which in one year resulted in our highest wave of vaccination breaks. Last spring and early summer, considerable quantities of impotent serum and in some cases

[68] Hog Cholera Vaccination Breaks and Their Prevention, by James W. Benner, New York State Veterinary College at Cornell University. Journal of the American Veterinary Medical Association, Vol. 24, No. 1, April, 1927.

impotent virus were used. The impotency seemed to be due to the fact that the products were near the age limit, which at present is too long.

There is evidence that certain serum companies took advantage of the situation and sold serum that might have been valuable for its antiquity but was absolutely worthless for the function it was supposed to perform. The natural result was thousands of vaccination breaks, with serum breaks in the majority.

Swine plague bacterins, mixed infection bacterins, necro-bacillosis powders and kindred products are questionable lines of treatment under any condition and it is nothing short of malpractice when such substances are used in cases where the use of serum alone or serum and virus are so plainly indicated.

The prevention of hog cholera vaccination breaks is a cooperative procedure. All parties concerned are exposed to loss when a break occurs. The farmer is sure of getting his. He must pay his vaccination bill although his hogs die later with cholera. The practitioner may lose the confidence of his clients which he has worked day and night to gain, if the blame can be fixed upon his shoulders. The serum-producer has the reputation of his product at stake. The government has its political prestige to lose, as an efficient guardian of the swine industry.

Th practitioner's responsibilities are complex. He must prevent breaks and do it as cheaply as possible. His part in preventing breaks consists of determining the thrift status of the herd, which involves a knowledge of the natural habits of hogs, feeds and feeding, sanitation, also physiology and pathology. In brief, he should know swine and swine diseases. He is fortunate if he has had practical experience in handling swine before taking his veterinary course. It will aid him in detecting unfavorable care and management and in advising sensible and practical improvements in methods. He should never neglect to instruct the owner concerning the care of a vaccinated herd.

He must do the vaccinating not only better than the farmer can do it, but we must do it enough better to be worthy of a good fee and still leave him with a good profit on our services.

At present, the breaking point of a serum is not being located accurately enough, which in large part means not often enough or recently enough, and the practitioner is not properly informed regarding it. A serum producer can take serum that broke for the practitioner, and by increasing the dose, vaccinate without trouble, for he knows his serum while the practitioner does not.

Virus breaks are not so common. Slaughtering hogs from eight to twelve months of age without doubt hides the low immunizing properties of much virus. A virus may have potency enough to immunize from eight to twelve months but not enough to immunize for from eighteen to twenty-four months. Obviously, the younger the pig when vaccinated, the longer he has to go to market age. This may be a reason why virus breaks have seemed to occur more often in pigs that were given the simultaneous treatment under six weeks of age.

Clear Concentrated Serum Increasing in Popularity

D. I. Skidmore,[66] in a recent Bureau circular, calls attention to the properties of the three types of serum, blood serum, clear filled serum and clear concentrated serum now officially approved by the Bureau for distribution. A table giving the amount of serum of the various types distributed this year and last, shows the increasing popularity of the clear concentrated serum.

The discussion of the qualities of each type of serum in this bulletin clearly favors the clear concentrated product, and enumerates no advantages to the user that either of the other two types have over it. From a reading of this bulletin, one might predict that at no very distant time, approval of the Bureau for blood serum and filled clear serum may be withdrawn and clear concentrated serum remain the only type that can be shipped interstate.

[66] Comparative Values of Types of Anti-Hog-Cholera Serum, by D. I. Skidmore, Chief, Division of Virus-Serum Control, Bureau of Animal Industry. United States Department of Agriculture Circular No. 11, October, 1927.

The General Situation

The extensive outbreak of hog cholera during 1926 resulted in the marketing of large numbers of gilts and brood sows, consequently, the 1927 spring pig crop was slightly below normal.

Anticipating extensive vaccination of swine, serum production was continued at a high volume by practically all serum companies and during the first nine months of 1927, approximately 1,600,000,000 cc. of anti-hog cholera serum (or nearly four times the amount produced during the same period of 1926) was produced under Government supervision. Although there have been many outbreaks of cholera in restricted areas, there has not been a repetition of the widespread outbreaks of 1926. The diminished spring pig crop of 1927 was reflected on the market of swine during the early fall months, hogs having sold at a higher price than usual at this season of the year. The small spring crop also resulted in more extensive breeding for fall farrowing, however, the breeding was delayed and the fall farrowing was on an average of about one month later than usual. This was because of the unusual weather conditions throughout the corn states.

The outstanding feature of swine diseases for the present year consists of the widespread occurrence of infection with the *Bacillus suipestifer*. The occurrence of mycotic vaginitis and a condition in which there is a marked pulmonary edema. The latter condition may or may not be a complication of hemorrhagic septicemia, hog cholera or suipestifer infection. The pulmonary edema has been responsible for rather extensive losses in some particular sections of the country. The literature on swine problems for the present season has been about as usual.

Mineral Metabolism of Swine was discussed at length by E. B. Forbes.[67] Many valuable suggestions were given and experiments related relative to the influence of calcium, iodin deficiency and goitre, and the importance of vitamins.

A general discussion of the proper feeding of swine[68] occurred in the August issue of VETERINARY MEDICINE. There occurs in this article a brief discussion of the variation of the composition of sow's milk and the importance of selecting high-grade milking sows for breeding purposes. Also, the proper method of compounding a prepared milk for orphan pigs.

Much valuable information relative to the viability of *Ascaris suum* ova exposed to weather conditions was given by H. B. Raffensberger.[69] This article has already been discussed briefly. Some of the principal conclusions were: That a small percentage of ascarid eggs persist for one year on soil in the vicinity of Chicago.

A further description of ascarids including a brief discussion on life cycle of parasites, symptoms, lesions, preventive measures appeared in VETERINARY MEDICINE in an article, "Losses of Pigs Due to Ascarid Infestation."[70]

Five per cent of the hogs slaughtered at the municipal abattoirs at Baton Rouge, according to an article by Harry Morris,[71] were affected with echinococcus cysts. Practically all of these swine were produced on farms within a short radius of Baton Rouge. Most of these hogs come from high lands rather than low lands. This condition is of some economic importance.

Many of the disorders in suckling pigs are traceable directly to inflammatory disorders of the mammary glands of the sow. It was pointed out that scour and digestive disorders of various kinds frequently have their origin in milk contaminated with infection from inflamed udders. These de-

[67] Mineral Metabolism of Dairy Cattle & Swine, by E. B. Forbes, Director, Institute of Animal Nutrition, Pennsylvania State College. 30th Annual Report of the United States Live Stock Sanitary Association.

[68] Feeding of Swine an Important Problem, by A. T. Kinsley. VETERINARY MEDICINE, Vol. 22, No. 8, August, 1927.

[69] Viability of Ascaris Suum Ova Exposed to Weather Conditions, by H. B. Raffensperger. VETERINARY MEDICINE, Vol. 22, No. 6, June, 1927.

[70] Losses of Pigs Due to Ascarid Infestation, by A. T. Kinsley. VETERINARY MEDICINE, Vol. 22, No. 2, February, 1927.

[71] Echinococcus Cysts in the Liver of Hogs, by Harry Morris, Louisiana Experiment Station. Journal of the American Veterinary Medicine Association, Vol. 24, No. 5, August, 1927.

tails will be found in an article on mastitis relatively common in sows, by T. A. Kinsley[72] in the July issue of VETERINARY MEDICINE.

The cause, symptoms, diagnosis, prevention and treatment of stomatitis in pigs[73] was discussed in an article in the January issue of VETERINARY MEDICINE. In this article is a clear-cut discussion of the differential diagnosis of stomatitis due to various microbian agents.

Some articles have appeared, giving further experimental data relative to the possibility of permanently immunizing suckling pigs against hog cholera.[74] Although it is generally conceded that it is possible to permanently immunize suckling pigs against cholera providing the serum and virus is of the proper potency and virulency. Because of the inability of standardizing virus, it does not seem feasible to recommend baby pig immunization for general practice at this time.

J. C. Glenn[75] and many others have written articles discussing vaccination "breaks" and post-vaccination troubles generally. Many reports have been forthcoming of the losses of swine after vaccination. It is very evident that there are several factors that must be taken into consideration in the loss of hogs after vaccination with serum and virus. The most important factors are the hog, the serum and virus, the operation and aftercare. It has been demonstrated that if swine are healthy and the proper age when vaccinated with a known potent serum and virulent virus in sufficient dosage and are properly cared for afterwards, cholera breaks are practically unknown. Most of the post-vaccination losses the present season have been traceable to secondary infection with the B. suipestifer, hemorrhagic septicemia, edema of the lungs, or parasitism.

[72] Mastitis Relatively Common in Sows, by A. T. Kinsley, VETERINARY MEDICINE, Vol. 22, No. 7, July, 1927.
[73] Loss of Pigs due to Stomatitis, by A. T. Kinsley. VETERINARY MEDICINE, Vol. 22, No. 1, January, 1927.
[74] Observation on Duration of Cholera Immunity in Baby Pigs Following Serum and Virus Treatment, by Robert Graham, I. B. Boughton, and E. A. Tunnicliff, Laboratory of Animal Pathology and Hygiene University of Illinois. Journal of the American Veterinary Medical Association, Vol. 23, No. 4, January, 1927.
[75] Post-Vaccination Troubles in Swine, by J. C. Glenn. VETERINARY MEDICINE, Vol. 22, No. 3, March, 1927.

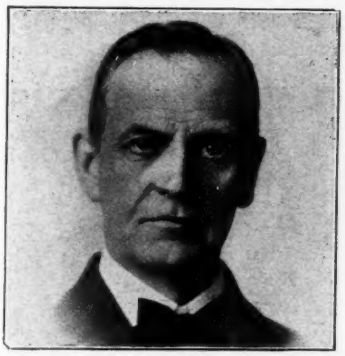
LOOKING BACKWARD

The space available for any retrospect covering a period of four decades does not permit an attempt to mirror the literature of the profession or to record its achievements during that time; or indeed to mention more than a few of the occurrences that have had an influence on the history of the profession. Confining this retrospect in a large measure to changes in the location, work, or position of individuals was determined because of the interest, rather than the importance, of these occurrences to present day veterinarians. Occurrences concerning veterinarians in official positions and institutions of a public nature were in the main selected because they are the more readily found in the records of its activities, that the profession has left.

Ten Years Ago

In 1917:

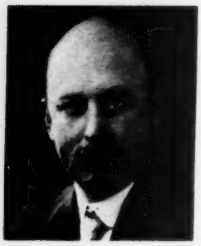
P. A. Fish was editor of the Journal of the American Veterinary Medical Association; C. E. Cotton was president; and L. A. Merillat secretary of the A. V. M. A. The annual meeting of the A. V. M. A. was held in Kansas City, 450 veterinarians were elected to membership and V. A. Moore was elected president. H. Preston Hoskins was with Parke, Davis & Company, and Reuben Hilty was a Major in the Army.



P. A. Fish

John R. Mohler was Assistant Chief of the Bureau of Animal Industry; A. Eichhorn resigned the position of Chief of the

Pathological Division in the B. A. I., to accept his present position with Lederle Laboratories; J. A. Kiernan was made Chief of the newly created Tuberculosis Eradication Division of the Bureau, and Maurice C. Hall was with Parke, Davis & Company. The entrance salary for veterinary inspectors in the Bureau was $1,400 a year.



J. R. Mohler

H. Preston Hoskins

C. P. Fitch resigned his position in the New York State Veterinary College at Cornell University for his present position at the University of Minnesota; R. P. Lyman was dean of the Veterinary Department of the Michigan Agricultural College; C. J. Marshall was state veterinarian of Pennsylvania; A. T. Peters was state veterinarian of Illinois; D. F. Luckey was state veterinarian of Missouri; J. I. Gibson was state veterinarian of Iowa; R. M. Gow was state veterinarian of Arkansas; L. E. Northrup was state veterinarian of Indiana; A. W. French was state veterinarian of Wyoming; and J. H. McNeil, recently returned from Brazil, was appointed Chief of the Bureau of Animal Industry of New Jersey. There have been changes in all of these positions except those held by Fitch and McNeil.

C. J. Marshall

A. Liautard was writing "European Chronicles" for the Journal of the American Veterinary Medical Association; W. Horace Hoskins was dean of the New York State Veterinary College at New York City; Joseph Hughes and M. H. McKillip were heads of the Chicago and the McKillip Veterinary Colleges; S. Stewart was dean of the Kansas City Veterinary College; J. F. Winchester was soliciting funds for the Salmon Memorial Fund; A. S. Cooley was State Veterinarian of Ohio; G. W. Dunphy was state veterinarian of Michigan; A. D. Melvin was chief of the B. A. I.; Frederick Torrance was Veterinary Director General of the Dominion of Canada; James Law was writing "Items in the Recent History of Veterinary Medicine," and W. H. Dalrymple contributed several articles on anthrax.

All these illustrious veterinarians have since passed to their final rewards. The anatomist, Jean Baptiste Auguste Chauveau, an honorary member of the A. V. M. A. died early in the year. Doctor Melvin's death occurred on December 7th.

The ninth annual conference for veterinarians was held at the New York State Veterinary College; the first annual Veterinary conference was held at Ames, Iowa, and at the University of California.

The World War was the all absorbing topic of the year and more than a thousand veterinarians were commissioned in the National Army. Of this number, only 12 from civil life were in the grade of major at the end of the year. They were: H. E. Bemis, C. E. Cotton, H. D. Gill, Reuben Hilty, L. A. Klein, M. E. Knowles, C. J. Marshall, L. A. Merillat, N. L. Nelson, J. P. Turner and D. S. White.

Twenty Years Ago

In 1907:

James Law of New York and W. H. Dalrymple of Louisiana were Presidents of the A. V. M. A.

A. D. Melvin was Chief of the Bureau of Animal Industry.

J. G. Rutherford was Veterinary Director General of the Dominion of Canada.

S. H. Ward was Chief of the Meat Inspection Department of the Dominion of Canada.

Roscoe R. Bell was editor of the American Veterinary Review.

Leonard Pearson was Dean of the Veterinary Department of the University of Pennsylvania. A. Smith was principal of the Ontario Veterinary College and L. L. Conkey was principal of the Grand Rapids Veterinary College.

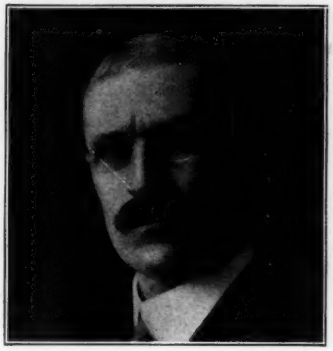
A. T. Kinsley

All of the aforementioned veterinarians have since died.

Ward Giltner was assistant state veterinarian of Alabama. F. B. Hadley was an instructor in the Washington State College at Pullman. Cassius Way was in the Laboratory of the New York State Veterinary College at Ithaca. A. T. Kinsley was Professor of Pathology and Bacteriology in the Kansas City Veterinary College. J. H. McNeil was head of the Veterinary Department of the Iowa State College at Ames. John R. Mohler was Chief of the Pathological Division of the Bureau of Animal Industry.

All of these incumbencies have changed.

R. P. Lyman, Connecticut was secretary of the A. V. M. A. B. F. Kaupp,



R. P. Lyman

Kansas City, was secretary of the Missouri Valley Veterinary Association. W. L. Williams was president of the New York State Veterinary Medical Association. C. J. Marshall was president of the Pennsylvania Veterinary Medical Association. Tait Butler was secretary of the Association of Veterinary Faculties and Examining Boards of North America.

Schmidt of Kolding, Denmark, was elected an honorary member of the A. V. M. A.

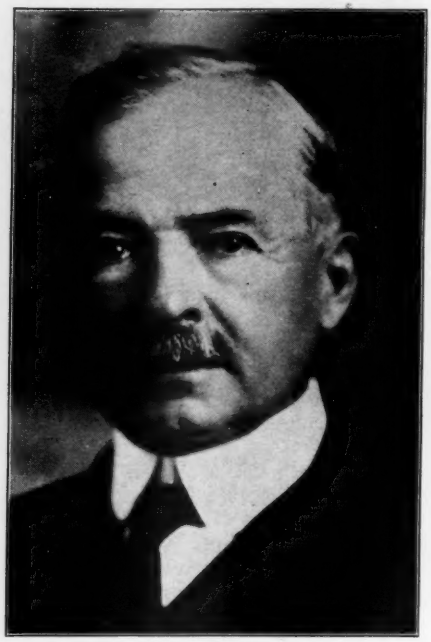
The title of the Bureau of Animal Industry employes was changed from "Meat Inspector" to "Veterinary Inspector."

The enrollment at the Kansas City Veterinary College was 453; at the Ontario Veterinary College, 400; and at the Chicago Veterinary College, 344.

W. L. Williams was co-editor of the Veterinary Journal, London. Of an article by him in that publication dealing with the shortcomings of American veterinary colleges, Prof. Liautard said: "The Professor is very severe and tells very hard truths."

The number of veterinary students in "state schools" was 621, not so markedly

different from the number at the present time. There were, however, an additional 1,419 in the "private schools" that no longer exist, making a total of 2,040.



M. Francis

L. A. Merillat in his report as resident secretary for Illinois to the United States Veterinary Medical Association at New Haven, Conn., in 1906 (published in 1907) referring to Illinois veterinary colleges, said: "I know of instances wherein men have been granted diplomas without even attending school at all, of some men who graduated after having attended only three months, and of many who have been so honored (?) with six months veterinary work. If an applicant for admission has been a dentist, if he has attended a year at a medical college, or a dental or pharmaceutical college, or has taken a course of lectures at an agricultural college, or if he can present any excuse whatever, he is admitted to advanced standing. . . . I am not referring to any one college to the exclusion of another, nor do I purport to know that the situation is any worse than that of similar schools in other states."

Thirty Years Ago

In 1897:

There were 16,000,000 horses in the United States.

The editor of the Veterinary Journal (London), Principle Williams, predicted that the new "auto-motor car" would to a large extent, replace the horse and profoundly affect the veterinary profession.

N. S. Mayo

A. Eichhorn

The Indiana Veterinary College graduated three students; the U. S. College of Veterinary Surgeons, 4; the Kansas City Veterinary College, 5; The McKillip Veterinary College, 10; The New York College of Veterinary Surgeons, 15; The Chicago Veterinary College, 22; and the Ontario Veterinary College, 64.

M. Francis was state veterinarian of Texas; M. H. Reynolds, state veterinarian of Minnesota; J. I. Gibson, state veterinarian of Iowa; C. A. Cary, state veterinarian of Alabama; A. T. Peters, experiment station veterinarian of Nebraska; Wm. Henry Kelly, secretary of the New York board of veterinary examiners; N. S. Mayo, Professor of Veterinary Science, Connecticut Agricultural College; C. J. Sihler resigned from the Bureau of Animal Industry; John R. Mohler, was Inspector for Mexico import cattle, San Diego, Calif., and Alexander Glass brought out the first edition of his Diseases of the Dog and Their Treatment.

W. L. Williams published an article on Infectious Abortion in Mares; the state veterinarian of Tennessee, received a sal-

ary of $50.00 a month, and a woman graduate of the New Veterinary College of Edinburgh was refused a license by the R. C. V. S. because of her sex.

The A. V. M. A. (U. S. V. M. A.) met in Nashville; the attendance was less than a hundred (it had never in the history of the association reached a hundred and was usually less than 50). The officers were: F. H. Osgood, president; S. Stewart, secretary; J. L. Robertson, treasurer,

D. F. Luckey

and vice-presidents, R. R. Bell, New York, M. Stalker, Iowa and M. R. Trumbower, Illinois. None of these are now living.

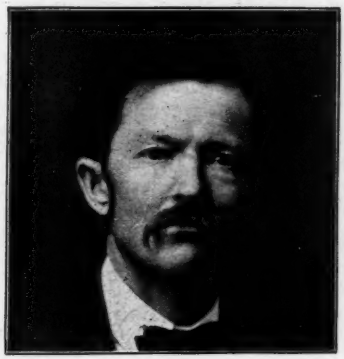
M. R. Trumbower was succeeded as state veterinarian of Illinois by Chas. P. Lovejoy, a non-graduate, who belittled scientific training for veterinarians, i. e., he knew not that he knew not. This appointment aroused a storm of unavailing protest from the graduate veterinarians of the state. He continued in office for nine years.

D. E. Salmon, Chief of the Bureau of Animal Industry said at the meeting of the U. S. V. M. A. in Nashville: "It would be injudicious at this time to agitate in favor of a national control of tuberculosis until the veterinary service is developed. We must count on building up the veterinary service gradually and just as soon as the field is covered in meat inspection, I am in favor of taking up some other question, but at present it is premature; the work is too large."

Forty Years Ago

In 1887:

The Chicago Veterinary College graduated 26, among them R. C. Moore of St.



C. A. Cary

Joseph, Mo., and Geo. R. Young of Omaha.

The graduating class of the Ontario Veterinary College numbered more than 100, and included J. I. Gibson of St. Joseph, Mo.

The graduating class of the Veterinary Department of Harvard University numbered seven; among them E. C. Schroeder, of Bethesda, Md.

Graduates of the Veterinary Department of the University of Pennsylvania numbered ten. R. S. Huidekoper was dean. The cases presented to the clinic during the year numbered 1,727 of which 429 were hospital cases, and 1,298 out patients.

A. Liautard was editor of the American Veterinary Review, and W. A. Conklin and Rush Shippen Huidekoper were editors of The Journal of Comparative Medicine and Surgery. The former was in its twenty-first and the latter in its seventh year of publication. R. Meade Smith, Wm. Osler, James Law, W. L. Zuill and Duncan McEachran were among the collaborators of the younger publication. Theobald Smith, then in the Bureau of Animal Industry, was a frequent contrib-

utor to veterinary magazines forty years ago.

The National Veterinary and Sanitary Association was formed, and its first meeting held in Chicago, October 15-17, 1886 (published in 1887). The principal question before the convention was contagious pleuro-pneumonia. Paul Paquin, state veterinarian of Missouri, was secretary. Drs. Salmon, and Gadsen of the B. A. I., who were inspecting cattle stables in Chicago, attended the meeting.

"The association was unanimous in its expression that extirpation, the pole-axe, is the only reasonable treatment and method of handling contagious pleuro-pneumonia, whatever the cost," and so memorialized Congress.

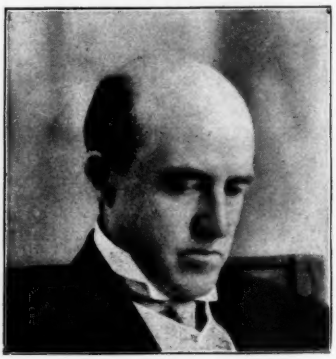
A. H. Baker
Has practiced in Chicago more than 50 years

Resolutions were adopted calling upon Congress to appropriate funds for a bureau of animal industry within the U. S. Department of Agriculture to combat infectious diseases of live stock. This resolution was endorsed at the National Cattle Growers Association who met in Chicago on the same date.

Parke, Davis & Company had a display of pharmaceuticals especially adapted to veterinary use, at this meeting.

At a meeting of the Missouri State Association of Veterinary Science and Comparative Medicine, Dr. Paul Paquin, state veterinarian, gave a report of his recent trip to Europe to study inoculation methods for the prevention of hog cholera.

Capt. R. W. Shufeldt of the medical corps of the army published an article deploring the veterinary service of the army and offered a plan for its reorganization strikingly similar to the one adopted thirty years later.



Geo. H. Glover

The 8th edition of Law's "Farmer's Veterinary Adviser" was published, and Geo. H. Glover established a practice in Denver, Colo.

FRACTURES

In treating most of the fractures that come here, and we often get five or six a day, I have used for some years the common black insulation tape used in the electrical trade. I buy this in boxes of one hundred pounds of rolls. The kind I buy from a local firm is the best I have ever received because it is wrapped in tin foil and always moist and adhesive.

This tape is the ideal thing in ordinary fractures of bones below the shoulder and femero-patellar joints. I have even used it in fractures of the humerus and femur. The limb is wrapped and splints applied and the tape rolled around, always starting with the foot, which is well encased. This arrangement is easily removed, easier than anything I know of for the same purpose. It can be made as rigid as desired, and seems to be repugnant to

most dogs, hence it is not molested by the patient. Not one in a hundred will eat it after licking it with the tongue.

A better way to remove it than with the use of a cast or blunt scissors, is with a heavy probe pointed curved bistory. This black tape can be used for a number of useful purposes around the hospital, i. e., covering bandages to make them water proof in the case of foot wounds, etc., and in general to prevent dogs from dislodging bandages. Ordinary tongue depressors are very handy to use as splints in small animals.

New Orleans, La. W. T. Ratigan.

BOOK REVIEWS

Should We Be Vaccinated?[1] A Survey of the Controversy in Its Historical and Scientific Aspects, by Bernhard J. Stern, Instructor of Sociology, Columbia University.

The publisher says of this book:

"It is a popular, critical, historical study of the sociological and psychological factors which have provoked the persistent opposition to vaccination, written by a sociologist interested in the problems of social change.

"Though it gives careful consideration to the arguments both for and against vaccination in the light of the most recent scientific investigations, this book is in no sense propaganda."

But while the book discusses vaccination in its historical and scientific aspects, it does much more than that. Incidentally it gives an insight into the manner of initiating and perpetuating countless "movements" and the main spring and works of those vociferous minorities that annually descend upon Congress.

The work is, in a measure, a text on community relations, or social development, or political economy, or whatever other term is used to designate a discussion of the more or less crude attempt of peoples at self government.

When the whole history of the subject is reviewed, one can only say that vaccination was and is opposed because *it did and does pay* to oppose it.

Opposition to vaccination originated with Dr. Benjamin Moseley and Dr. Joseph Merry, both of London. Merry's practice consisted largely of small pox inoculation and appeared in a fair way to be swept away by the popularity of vaccination. Moseley's practice consisted in a large part of treating small pox. This too, appeared to be doomed by the popularity of vaccination and its effect. In addition, Moseley was largely interested in marketing "Moseley's Pills" and the publicity and self advertisement to be attained from heading the anti-vaccination organization helped the sale of pills.

The contest over vaccination has had its religious and political aspects as well. When the dignitaries of one sect espoused vaccination, because of the bitter religious feeling of those times, equally high dignitaries of another sect, opposed it. It has had its political aspects. Vaccination was introduced into America by Dr. Benjamin Waterhouse of Cambridge, Mass. Its foremost supporter in high public and official life in America was Thomas Jefferson. The democratic Thomas Jefferson was thoroughly hated by puritan New England during the quarter century of intense political feeling that followed the American revolution; therefore many opposed vaccination because Jefferson favored it.

But religious and political aspects of the controversy have been transient in character. The opposition that has been sustained and has endured for more than a century and a quarter, has been the opposition based on financial interests.

The faddist in methods of healing, those hovering in the twilight zone about ethical medicine, and the quack and the out and out faker in the healing art, all have something to gain or think they have from opposing regular medicine, which they denominate the "medical trust," and the notoriety that they can

[1] Should We Be Vaccinated?, by Bernhard J. Stern; 146 pages; cloth bound; Harper & Brothers, New York, publishers; price, $1.50.

gain from battling this strawman of their own stuffing helps business. It also detracts the attention of followers from too close scrutiny of their own methods, and so we have an opposition to vaccination, the nucleus of which is that jolly band of chiropractors, naturopaths, napropaths, water cure and vegetable cure and mental healer, and similar ilk.

Of course, no "movement" would get far, or last long, if composed exclusively of such, but on a subject such as this, in which the public is not well able to judge the merits and demerits of the evidence, they are able to enlist a vast body of well meaning but poorly informed citizens who give weight and standing to their cause. People who far from profiting from the crusade usually in large part, finance it, and seem never to discover the insincerity and misrepresentation upon which it is based.

A single illustration of the many that might be sighted from the opposition to vaccination, will suffice. Early in the history of vaccination, John Simon wrote to the leading public health authorities in all the world, enclosing a questionnaire to be filled out, indicating the attitude on the question of vaccination. Of 542 who returned the questionnaire, 540 were unreservedly in favor of vaccination, one was non-committal, and one, a Doctor Hamernyk, was opposed to vaccination. From that day to this, Hamernyk's answer to Simon has been circulated by those opposed to vaccination with never a reference to the fact that of 541 public health authorities taking a position in the matter, 540 favored vaccination and he alone, opposed it.

With a preponderance of evidence in favor of vaccination, a thousand times greater than the preponderance of evidence that would be required by any jury to send a man to the gallows, there are yet in the United States, six states that have no vaccination laws and one, Utah, that has an anti-vaccination law of widest scope.

The history of the creed that holds the existence of rabies to be a myth, of the anti-vivisection society, of the League for Medical Freedom, of the anti-this and anti-that and of leagues without number might be arranged upon the same framework that is revealed for the anti-vaccination program. Deprive these "movements" of their paid "executive secretaries" and their "general counsels" and of those who profit in a business way and they would fall from the weight of their own absurdities.

Handbook for Veterinary Surgeons, by Fred Bullock.[2]

This little book contains most useful information for a veterinarian. Since it deals with the administration of the profession, licensing, laws, ethics and professional matters as they apply to the veterinarian in Great Britain, it is less applicable to American veterinarians. However, there are several chapters of general application and from these in particular, the American practitioner may derive useful advice. Chapters on professional conduct, on commencing a practice, on partnerships and keeping accounts, fall within these as does in the main, the chapter on legal responsibilities.

The comment of Sir John McFadden on reading the manuscript, "One is surprised that this had not been published long ago," seems apropos indeed. Now that Mr. Bullock has blazed the trail in this matter, the reviewer can but hope that a similar work may be undertaken for the benefit of the veterinary profession of America. The preparation of such a work would seem a worthy and fitting task for the A. V. M. A.

Training the Dog, by Will Judy.[3] The author of this work, as most of our readers know, is head of the Judy Publishing Company and editor of "The Dog World."

[2] Handbook for Veterinary Surgeons, by Fred Bullock, LL.B., London; 96 pages; paper bound; Taylor & Francis, Red Lion Court, Fleet St., E. C. 4, London, England, publishers; price, 2 shillings, 6 pence.

[3] Training the Dog, by Will Judy; 111 pages; cloth bound; Judy Publishing Company, Chicago, publishers; price, $1.50.

The book comes from an authoritative source and will be useful to veterinarians not only in enabling them to systematize their advice to their clients in this matter, but as a text to recommend to clients as an answer to the ever recurring questions, of: "How can I house break my dog?" "How can I teach my dog to be a watch dog?" "How can I get my dog to mind?" "How can I keep him from destroying things and eating garbage," "barking at visitors," "chasing cats" and all the minor nuisances committed by the untrained dog?

The little book is not, as its title might lead one to suspect, a discussion of schooling of the trick or performing dog of the stage, but is concerned with the basic principles of teaching the dog to mind its master and to conduct itself as a well mannered dog.

Some extraneous matter is included in the work, such as why the world likes dogs, a dog's prayer, how to administer medicine, etc., and while this does not add to the value of the work, it does not seriously detract from its value.

Kennel Building and Plans, by Will Judy.[4] This work claims to have the merit of being the only book available on the subject. That there is a demand for information on the housing of dogs is undeniable. This is an effort to meet the demand. Although it deals, in the main with elaborate establishments for the care and breeding of dogs commercially, for the general effect to be attained, the principles to be followed it is applicable to the less pretentious but far more numerous establishments.

Scientific Report of the Kazan Imperial Veterinary Institute. This report includes a history of the Institute from the date of its foundation. During the 50-year period, 1874-1924, 5,373 students entered the veterinary school and 2,676, approximately 50 per cent, graduated as veterinary surgeons. In the Veterinary Assistant's School (Feldsher School) 574 students entered and 360 graduated. This Veterinary Feldsher School was closed in 1918.

The Institute has issued 36 volumes of scientific reports and 800 popular bulletins on veterinary subjects and animal industry.

The report states that while in 1874 there were 22 veterinary schools in the entire world, of which four were in Russia, there are at present in the entire world, 42 veterinary schools, of which 10 are in Russia.

The Kazan Veterinary Institute has 76 professors, instructors and assistants and plans to increase their number to 122. The Institute offers instruction in veterinary medicine only, and is divided into two branches, one branch offers instruction to students intending to pursue civilian veterinary callings, while the other branch is for those that intend to become army veterinarians. The course of instruction beginning in 1926 covers a period of five years. The students entering the fifth year are required to have practiced with a qualified veterinarian during the preceding summer.

The subjects included in the civil branch are similar to those in our schools, with the *addition* of instruction in political economy, history and principles of Leninism and soviet economical politics, etc. In the military branch, additional instruction is given in military administration, topography, equitation, strategy and examples from the World War; military tactics, military geography, horse-breeding, horse-shoeing (200 hours practical work), feeds and feeding, army veterinary service, military chemistry and the German language.

This volume, in addition to the various reports on the activities of the Institution, etc., contains 25 articles on various scientific subjects—veterinary bacteriology, pathology, parasitology, dourine, etc.

From the article on the intradermo-palpebral test for glanders by Vereshagin, it appears that glanders is not as yet on the decrease in Russia. To quote: "If the disease (glanders) in the Western Empires is on the decrease, and is controlled by the

[4] Kennel Building and Plans, by Will Judy; 29 pages; paper bound; Judy Publishing Company, Chicago, publishers; price, $1.00.

Volume XXXVII, No. 1, 330 pages—Issued in 1926 in Commemoration of the 50th Anniversary (1874-1924) of the Kazan Imperial Institute, Union of the Soviet of Socialistic Republics.

methods used to combat it; we in Russia cannot say as much. The number of horses registered as infected with glanders is increasing yearly. It is true, we must agree that this gradual increase in the number of horses registered as infected with glanders to considerable extent depends on the gradual betterment of the veterinary sanitary inspections in Russia. To our regret we have not the exact statistics of the intensive extent of glanders in our Union. The official estimate even of late years cannot be counted as sufficiently correct, as Russia is deficient in veterinary personnel and they are overburdened with the field service beyond their strength."

The writer gives the history of mallein, subcutaneous, opthalmic, intrapalpebral and intradermo-palpebral tests. He gives statistics as to the use of the above tests in some European countries as well as in Russia, and describes the technic of the intradermo-palpebral test and advocates its use in the diagnosis of glanders; since it offers a combination test that is 96 per cent correct. Furthermore, the reaction to the combined test is more conspicuous and permanent, lasting two or three days or more.

In an article on thermo-coagulation in the diagnosis of glanders in horses by the same writer, he described the thermo-coagulation test. Professor Tushnov observed that the serum of horses infected with glanders becomes opalescent and turbid when heated. This phenomena was observed also by Feders, Vladsco and Popesco. For this test the blood is drawn in the morning before feeding. It is drawn into a warm container and allowed to coagulate in a thermostat. The clear serum of the suspected animal is heated to a temperature 56° to 58° C. for 30 minutes (120.8° to 136.4° F.)

a. Positive reaction — serum becomes turbid.
b. Weak positive reaction — serum becomes opalescent.
c. Doubtful reaction — serum becomes barely opalescent.
d. Negative reaction — no noticeable change.

The serum of horses free from glanders becomes turbid only at a temperature of 66° C. (150.8° F.) or higher. The writer describes the theory of thermo-coagulation; the result of the test on serum of horses free from glanders and on the serum of horses infected with glanders. He suggests this test, where it is desirable to run a test in connection with malleinization since it is simple and can be made in any veterinarian's office without the aid of a laboratory, laboratories being so few in Russia.

The volume contains four additional interesting articles on glanders by Prof. Bohl and his assistants and an extended account of parasites and parasitisms in Russia.—I. Wallman, Chicago.

La Pratique de la Desinfection,[6] by Besson, A. and G. Ehringer. The importance of disinfection in hygiene is such that in all lands national authority is invoked to prescribe it and regulate it.

The first part of this book is devoted to the study of sanitary regulation in France, the author assembling there all the laws, decrees and regulations concerning disinfection. This constitutes an excellent guide if applied with care, good sense and intelligence.

The second part describes processes of disinfection, rather numerous, of diverse value but useful on occasion.

The third part considers choice of processes as applicable to various conditions. It is a very important part if applied judiciously. Processes of destruction of parasitic insects, rats, noxious animals which are reservoirs of virus, knowledge of which is today indispensable, are discussed. The work terminates in a rapid review of methods to be employed against the propagation of each infectious disease. The treatment is clear and will be found modern and scientific.—From *Rec. de Med. Vet.*

Food poisoning due to a streptococcus in cheese has been reported in several different localities. In one instance, 18 people that partook of the same cheese became ill. The streptococcus that has caused the poisoning is very similar to the lactic acid streptococcus and may be introduced with the starter.

[6] Published, 1926 by Balliere et Fils, Paris.

TUBERCULE BACILLUS DISCOVERED

A Parasite The Cause of Bovine Tuberculosis.—Dr. Robert Koch, a German physician, has discovered a minute organism in the lungs of consumptive animals. He considers it to be the veritable cause of tuberculosis in all its forms in man as well as in beast. The organism in question is rod-shaped, and about one six-thousandths of an inch long. It is found in tuberculosis matter everywhere, even in tuberculous sputa. Dr. Koch cultivated it in ox-serum, then inoculated animal with the cultures. In this way he claims that he has processed a true tuberculosis. The discoverer of the new organism thinks that bovine and human tuberculosis are identical; also that tuberculosis can be given to man by the milk, and perhaps flesh, of tuberculous cows. Dr. Koch's conclusions have a very important bearing on veterinary sanitary science, if they are true. This is far from being proven as yet.—Editorial in The *Journal of Comparative Medicine and Surgery,* July, 1882.

SHOULD VETERINARY EDUCATION RETRACE ITS STEPS

Commenting on the article by W. C. Van Allstyne in the September issue of Veterinary Medicine, with which I do not in the least agree, it appears to me that his statements and comparisons are decidedly far-fetched. Quite naturally, if the bars are lowered, we should have more veterinarians of a class, but I cannot agree that this class is in need of replenishing. The only demand I have ever heard from live stock owners was not for cheaper veterinarians, but for men with more knowledge of all problems pertaining to live stock.

I should always prefer, in case of sickness among members of my own family, to call a physician who at one call could make a diagnosis and outline the proper treatment, even though he might charge, say ten dollars, than to have a number of calls from one who charged three dollars, but whose advice failed to produce benefits. An intelligent live stock man would unquestionably feel the same way regarding calling a veterinarian.

A large number of highly efficient veterinarians were produced under the old system, but in spite of it, rather than because of it. Does anyone doubt that they would have been better with more knowledge?

I am personally acquainted with many veterinarians who are making at least a comfortable living in communities where cattle, horses and swine calls constitute the bulk of their practice. The livestock owners are well satisfied, too, but where is the farmer "with soul so dead" as not to kick about the cost of veterinary service? So does the average person complain about the charges of physicians and dentists, the barber's fee, the grocery bill, and the prohibitive cost of pure Scotch.

There is ample opportunity for the well-trained veterinarian. These boys who come to California and take elevator jobs are mute evidence that the profession has its ups and downs. The fact that they are willing to accept elevator jobs indicates that we are still producing veterinarians of different grades in ambition. Perhaps they are sold on the California climate. Dr. Van Allstyne's article would have been dangerous if many were inclined to take it seriously. Fortunately, that will not be the case.

Fontana, Calif. P. C. Guyselman.

According to Whitehouse, the following combination has been successfully used in N. S. Wales in the control of stomach worms in sheep:

White arsenic	IV ʒ
Copper sulphate	XVI ʒ
Hydrochloric acid	XII ʒ
Water qs.	1.5 gallons

M. and give per os from one-half to three drams every thirty days.

Nutritional Bumblefoot

By F. D. PATTERSON, Jr., Auburn, Ala.,
Department of Veterinary Medicine, Alabama Polytechnic Institute

IN this issue we are beginning a series of articles on nutritional diseases of chickens. The first article in the series will deal with a condition that we will for the present, at least, name nutritional bumblefoot. I have had the opportunity of carefully observing this disease for the past three years, being connected with the Alabama egg-laying contest, and this condition has given us much concern.

This condition is found in the pens that are forced to their full capacity on high protein concentrates, especially is this true when the right kind of green food can not be had in abundant quantities. Green food aids in prevention and control of all abnormal conditions that are traceable to protein excess. In our experience the variety of birds has a marked bearing on this condition. The contest consists of a number of varieties. Several varieties of middle weight or general purpose breeds are among those entered in the contest, including two varieties of orpingtons. The weight factor is mentioned because it tends to prove that mechanical injury is not a prominent factor in producing the type of bumblefoot under discussion, though it may be a complicating one. Besides the floors are all well padded. All varieties are kept under as near the same conditions as is possible. Mechanical bumblefoot occurs almost entirely in the heavier breeds, rarely if ever in the light weight breeds, whereas, this is reversed in nutritional bumblefoot. At least that has been our experience. The s. c. white leghorn seems to be the more susceptible by far to the disease in question than any other variety. They are also the most prolific, so that high production may be a factor. This contest contains more of the s. c. white leghorns than all other varieties combined; but nutritional bumblefoot occurs in them in frequency far out of proportion to their superior numbers.

The condition under discussion may suggest articular gout and it may be a form of that disease, but it is certainly not the ordinary type, for in articular gout, joint lesions predominate and are the first to appear. Lameness is also more pronounced, where as in nutritional bumblefoot the balls of the feet and connective tissue between the toes are primarily affected, though the joints often become involved eventually, probably due in a large measure to secondary bacterial invasion. The lesions are also different in character.

There are three things so far as etiology is concerned that I am confident of. (1) That this disease occurs almost entirely in forced fed flocks, that is, flocks that are fed large quantities of mashes containing high percentages of protein concentrates. (2) That this condition is more prevalent and much more severe when the proper kind and amount of green food is lacking. (3) That the s. c. white leghorn are more susceptible than are other breeds or varieties. Besides these three factors confinement and secondary bacterial invasion play a part. No doubt much of the diseased processes in this disease are produced by the complicating secondary infection.

Symptoms and Lesions

The symptoms usually begin with an enlargement and tenderness of the balls of the feet and between the toes. This becomes more pronounced and pus forms which is of a mixed fluid and caseated type. Sometimes these lesions contain a thin watery fluid containing pus like material surrounding a caseated mass. The pus present is usually light in color, often slightly tinged with yellow, but may be-

come much darker as the process of necrosis advances. All stages of necrosis are met with, and the diseased condition may extend to just above the joint to which the toes are attached, but I have never seen it extend very much above this joint, and not many cases in which it went higher than the joints. The neighboring joints may become involved but the condition is usually confined to the balls of the feet and the connective tissue between the toes. The character of the pus differs from that found in ordinary or pressure bumblefoot in that in the nutritional type more liquid pus is present though much caseated solidified pus is also present and in the nutritional type the necrotic material is very easily separated from the surrounding tissue. There is also a difference in color, it being lighter as a rule. Pressure bumblefoot does not usually contain liquid pus in any appreciable amounts and the caseated material is very hard to separate from the normal tissue, it often being interspersed with other tissue. Fowl pus is usually solidified wherever found. The pus in nutritional bumblefoot resembles that found in diphtheretic roup to a marked extent. The type of bumblefoot in question runs a chronic course. The birds are lame but unless very badly affected seem to get about fairly well. The hens so affected may continue to produce for a long time though egg production is seriously lowered. Unless complications set in the birds may live for some time, though many die from the affect of high protein mashes on other parts of the fowl, especially upon the intestines, kidney, liver, and nervous system.

Treatment

This condition is much easier prevented than cured. The ration should be so regulated as to prevent its occurrence as far as practical. When the first symptoms appear reduce the protein concentrates in the mash and feed more grain and see to it that green food is abundantly supplied.

Individual treatment consists of opening the abscess and removing all pus and other necrotic tissue. The caseated material usually separates from the surrounding tissue without much trouble, frequently it all comes away in one mass. If the first operation is not completely successful repeat as often as necessary. After the material is removed pack with tincture iodin and cotton. Little success will follow the surgical removal unless the ration or diet is corrected, it often being necessary to remove the protein concentrates entirely, though this is often hard to do for if you are treating a commercial, egg-producing flock, this cuts production, but I believe it best to have a temporary egg cut than force so many hens to be withdrawn entirely from the pen. The owner will not, as a rule, see things this way. Very badly affected birds should, as a rule, be destroyed.

Occurrence

When this disease makes its appearance large numbers of them are usually affected as a rule; often twenty-five per cent of the pen and more as time goes on, unless the protein concentrates in the ration is reduced to reasonable limits. Sometimes nearly every hen in a certain pen becomes affected. Buttermilk is an excellent substitute for the animal protein usually used. Buttermilk is an animal protein, though it is a harmless one and one that can be safely fed to birds in any condition or state of health. This valuable product, however, should never be kept long in a tin container.

Hemorrhagic septicemia in cattle in India is most prevalent during the summer monsoon. According to Bennett, the B. bipolaris can maintain itself and multiply outside the animal body in soil and water. The disease is rapidly fatal in cattle in India and the mortality is high. The best method of control, according to reports, is by the use of bacterins. Anti-hemorrhagic serum is of value in some herds, but the immunity is of short duration and it is usually necessary to follow up the serum treatment with bacterins.

LEAD POISONING IN CALVES

On page 456 of the November issue of VETERINARY MEDICINE there is a reply to an inquiry, headed "Hemorrhagic Septicemia or Plant Poisoning."

I do not agree with the diagnosis. Within the limits of the very brief description of the symptoms and history, I doubt if one could paint a better picture of lead poisoning as the cause of death of the five Jersey calves, and I offer the suggestion that whenever the inquirer removes that bucket of white lead or paint from among the "flowers, vines and blue grass," the calves in that herd will cease dying in convulsions.

New Haven, Mo. E. E. Murphy.

THREE TYPES OF ASCITES IN DOGS

In a recent publication, I note the use of novasural in ascites. The authors state that they did not tap the dog because of having acquired confidence in the merits of a "new" and unofficial remedy, containing 33.9 per cent of mercury, novasural.

Novasural is not a new remedy. I used it as long ago as 1922. It may have had "whiskers" on it then. The "genus" of novasural I have used and sometimes now use is the Bayer product.

I doubt if there is any other city in the world where there are as many cases of ascites as there are here.

We classify ascites in a rough way into three classes, i. e., those due to obstruction to the portal circulation, and there is no question but what diet has a great deal to do with this type; secondly, the cases that on postmortem examination reveal cloudy swelling or other degenerative changes of the heart and kidneys, and we call these the cardio-renal cases; and thirdly, the cases due to the presence of filaria immitis in the heart.

Anyone staying here a little while will soon get over the idea that only middle aged or older dogs become dropsical. I tried novasural in filariasis. I've tried everything else that would seem to have any remedial properties in this condition. I could not see any benefit from novasural in a great many cases of heart worm infestation that has dropsy as a complication. A Mrs. Salvant in this city presented at our hospital some years ago a fox terrier that was greatly distended. This dog was put on a light diet of lean raw beef, a very limited quantity of crushed ice several times a day, and diuretics and laxatives, and in about ten days seemed normal and never "filled" again until a few months ago, when I was asked to destroy it after having tapped it several times.

There is in my mind no set treatment for every case of ascites, many things have to be considered.

New Orleans, La. W. J. Ratigan.

TREATING POLL-EVIL WITHOUT THE KNIFE

Recently, when coming out of a school house where I had been attending an educational meeting, I saw a nice big team of horses passing. Recognizing the driver, I signaled to him to stop and I stepped around on the off side and upon raising the bridle on the big grey, I saw a very small scar.

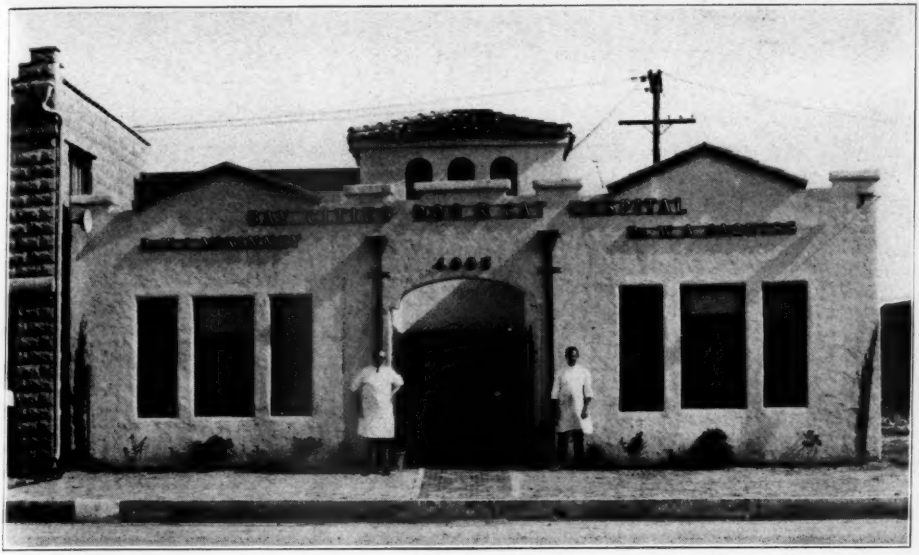
I then asked the driver if the horse had remained sound since treatment and he nodded his head and drove on.

This horse was brought to me two years ago, so bad with poll evil that the owner was advised to kill him by people along the road before he got to my place, and as the owner expressed it, "his whole d——n head was rotten."

I am a practitioner and not a specialist, and I do not have any secret formulae or any cure-alls for sale, but for the benefit of our eminent "bloody" type of surgeon who believes that the more segments of the cervical vertebra that they can let the sun shine in on, the better are their chances for a cure, or for those that believe in this type of vivisection, I will say that neither sharp or dull scalpel or any other type of knife was used in treating the grey horse above mentioned.

Rembrandt Morgan.

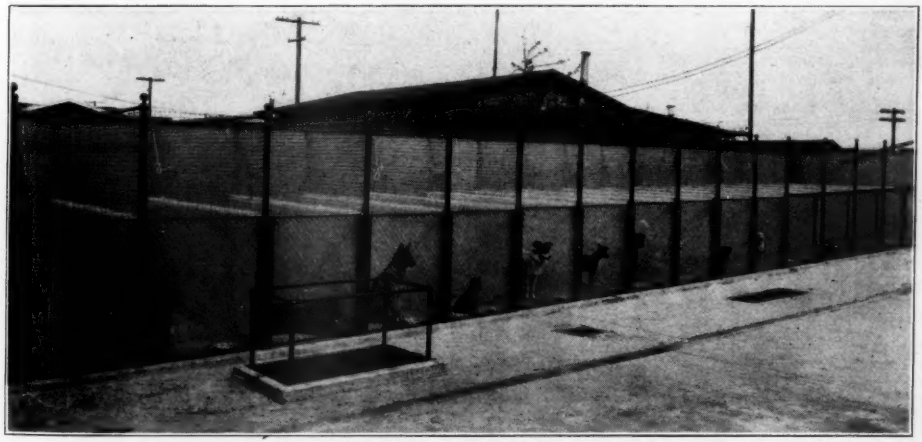
Winfield, W. Va.



BAY CITIES DOG AND CAT HOSPITAL

W. J. McKinney, formerly of Brooklyn, N. Y., came to California to rest and leave the veterinary worries to the younger men. But the old urge came to him and he built one of the finest and most complete hospitals on the coast—the Bay Cities Dog and Cat Hospital, 4005 Washington Boulevard, Venice, California. The buildings are of concrete construction, floors are processed and outside kennels are of steel and concrete, and heated. It is located at the junction of Venice, Santa Monica and Culver City boundaries and on Washington Highway, leading to the beaches from Los Angeles.

The doctor is hale and hearty and practicing every day. Any visiting veterinarians are extended a cordial invitation to visit the hospital.



Roof Garden Kennels, Bay Cities Cat and Dog Hospital

VETERINARY MEDICINE

Vol. 22 January to December 1927

Published by VETERINARY MAGAZINE CORPORATION
Chicago

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